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Full Name of Author — Nom complet de l'auteur

Ms. Marylou Mac Isaac

Date of Birth — Date de naissance

April 12, 1955

Country of Birth — Lieu de naissance

CANADA

Permanent Address — Résidence fixe

54 Greensview Drive
Sherwood
Prince Edward Island C1A 6C3

Title of Thesis — Titre de la thèse

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Name of Supervisor — Nom du directeur de thèse

Dr. A.E. Wall

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DESCRIPTION AND ANALYSIS OF INDIVIDUALIZED INSTRUCTION IN GROSS-MOTOR SKILLS FOR MODERATELY MENTALLY RETARDED CHILDREN WITHIN THE PREP PLAY PROGRAM.

by

Mary Lou MacIsaac

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

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DEPARTMENT OF PHYSICAL EDUCATION

EDMONTON, ALBERTA

FALL, 1980.

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Description and Analysis of Individualized Instruction in Gross-Motor Skills for Moderately Mentally Retarded Children Within the PREP Play Program"

submitted by Mary Lou MacIsaac

in partial fulfillment of the requirements for the degree of Master of Arts.

.....

Supervisor - Murray Smith

.....Jane Watkinson.....

Date March 25-1980

ABSTRACT

The major focus of this research was to identify the contingencies which existed between teacher behaviors and learner responses within episodes of individualized instruction on gross motor skills. This issue was dealt with in two phases. Firstly, the data which was collected was transcribed from videotape recordings, into visual information through the implementation of an observational instrument designed to classify all behaviors which naturally occurred during instruction. Within the second phase of the study, an extensive analysis of the descriptive data was conducted. The material for each subject was critiqued according to the objective indices of the quality of instruction. Each data set was then evaluated and discussed in two dimensions: on an individual basis, as well as collectively from a programmatic perspective. The long range intention was to establish this procedure as a valuable source of teacher feedback and concurrently provide instructors with a catalyst for increased teacher effectiveness.

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CHAPTER I

INTRODUCTION

Of Youth At Play

To be free
to learn ...
Allowing
Time, Space
and others
to flow with environment
unbiased
selecting with personal preference.

To work at potential
with adult deliberation
yet youthful spirit.

To feel "in control"
knowing there's structure
or support
if one should stumble or lose direction.

To feel the thrill of accomplishment
yet handle its energy.
Accepting this knowledge
as another dimension
to be nurtured
and shared
In play.

Specialists in the area of child development have recognized the influence and authority which early play experiences exercise over the total development of the child. Studies in child behavior depict free play as the medium, wherein children may develop social, emotional, cognitive and motor skills. A non-retarded youngster seems to achieve and refine motor skills as a natural consequence

of play interactions with others and the environment. These children acquire new motor skills quite readily and utilize fundamental skills as pre-requisites for higher order or more complex skills.

Such is not typically the case, however, for mentally retarded children. Noble (1975) conducted extensive assessments of the play behaviors of pre-schoolaged retarded children and found this population to be drastically lacking in the quantity and quality of their play skills, when compared to their non-retarded counterparts. In addition, Noble found these children initiated very few activities and thus spent a large portion of their free time in idleness.

Several studies have been conducted in recent years with respect to the motor performance and play patterns of retarded children (Wall, 1974; Noble, 1975; Watkinson, 1977). Invariably, the studies noted difficulties in motor skill areas or in factors deemed essential to learning (i.e. deficits in the attentional processes, memory or receptive language). Wide individual differences in levels of motor functioning and in rates of development were repeatedly evident. Watkinson (1976) suggested that this variability makes it imperative that an individual

diagnostic and prescriptive approach be adopted in motor skills programming for mentally retarded children.

A recognition of the need for a highly structured educational program to facilitate growth in developmental processes has led to the establishment of the PREP Program, a program designed to instruct young moderately mentally retarded children in the skills of play. The central feature of the PREP Program is an ordered set of task-analyzed, instructional sequences designed to facilitate the assessment, selection and teaching of culturally - normative motor skills (Watkinson, 1976; Wall, Watkinson and Shatz, 1979). Each instructional sequence consists of criterion referenced performance objectives which specify increasingly skillful behavior on a given motor task. Following individual assessment, target skills are selected for instruction with teacher intervention occurring at carefully selected moments within a free play environment (Watkinson, 1976). During the past decade there has been a marked increase in research productivity in the areas of task analysis and criterion - referenced measurement techniques. Information emanating from studies in early education and skill learning for special populations, substantiate the program design and the instructional strategies advocated in the PREP Program (Mager, 1962;

Popham and Baker, 1970; Robb, 1972; Illingworth, 1972).

The purposes of the PREP Program are two-fold. PREP provides a direct service to a group of children within the community and it also acts as laboratory within the university environment for the development and examination of instructional materials and strategies (Watkinson and Wall, 1977).

Statement of the Problem

The major focus of this research will be the identification of contingencies which exist between teacher behaviors and learner responses within episodes of individualized instruction on gross motor skills within the PREP Program. By design, the investigation will be dealt with in two phases. Firstly, the data collected will be transcribed from video tape recordings, into visual information through the implementation of an observational instrument specifically designed for classification of behaviors which would naturally occur during instruction. Within the second phase of the study, an extensive analysis of the descriptive data shall be conducted. The material for each subject shall be critiqued according to established objective indicies of the quality of instruction. Each set of data will then be evaluated and discussed in two dimensions: 1) on an individual basis; relevant to each instructor's technique

and 2) strategies shall be regarded collectively from a programmatic perspective. The long range intention is to establish feedback and concurrently provide instructors with a catalyst for increased teacher effectiveness.

Limitations

One must consider the following factors as possible limitations of this study:

1) This study may have been limited to some extent in that the instructors were aware that videotape samples were being collected. This may have generated some degree of reactivity on the part of the instructors.

2) This study was slightly limited in that a wireless microphone had to be fastened to the instructor's clothing and a transmitter had to be carried in a pocket on their person. This was noted as a slight restriction during teacher demonstration on the task - forward roll.

3) This study may have been limited to a minor extent in that, prior to instruction, each subject was relocated to an environment suitably situated to accommodate videotape procedures. This action was contrary to strategies of intervention proposed in the PREP manual.

Delimitations

1) This study was delimited to ten instructional episodes, extending over the period of April 6 to April 26, 1978.

2) The study was delimited to a sample of 4 instructors and 8 students who were participants in the PREP

Play Program operated by the Department of Physical Education within the University of Alberta, Edmonton, Alberta. The instructors were all staff members, who were full-time university students and who had similar preparation in procedures of teaching motor skills to moderately mentally retarded children.

3) The study was delimited to include only the skills of instruction which were selected by the teachers from those prescribed for each individual subject according to the PREP administrative procedures.

4) This study may have been delimited to an extent due to the fact that the researcher acted as the criterion observer, and thus established the standard for inter observer agreement. Due to time and administrative factors, no attempt was made to verify the accuracy of these measures.

Definition of Terms

The definitions of each behavior or response coded within instructional episodes may be found in Appendix A.

PREP Program: A play program designed for young aged moderately mentally retarded children operated by the Department of Physical Education within the University of Alberta.

Instructional Trial: One incident, within an instructional episode, whereby the learner makes an attempt at performing the desired response.

Instructional Episode: A variable period of time in which the instructor assists the learner to develop a motor skill. There may be any number of trials within the episode, dependent upon the nature and duration of the task.

Individualized Instruction: This refers to the teaching-learning situation whereby one teacher instructs one subject on a skill that has been prescribed on the basis of assessment of the child's skill repetoire (Whincup, 1978).

Data Set: The collective presentation of the data prepared for each instructor and subject depicting information of successive instructional episodes.

Continuous Skill: A task in which execution is steadily recurring; successive unbroken trials within an instructional episode.

Discrete Skill: A task in which skill components and trials are individually distinct.

CHAPTER II

REVIEW OF THE LITERATURE

Human Performance Theory

The human performance theory refers to a current trend of thinking which attempts to determine man's ability to sense, attend to, store and transmit information. In essence, the model designates three major mechanisms which mediate information between the environment and skilled action. According to Annett, 1971

> The information processing model is normally presented as a chain of component processes, with information entering a perceptual system, being filtered and coded, passing then into a central channel which has a limited "decision making" capacity - often thought of as a translation mechanism - then out to the effector mechanism (Annett, 1971, p. 267).

The model, to be described, was formulated by Welford in 1968 and, as depicted by Marteniuk in 1976, attempts to explain how the component processes of performance interact during the execution of complex perceptual motor tasks. As the model states, the function of the perceptual mechanism, which receives environmental information from the senses, is to provide the central mechanisms with an environmental description - a procedure of identifying and classifying information. A summary description of the

environment, in a pre-arranged code, is then sent to the decision mechanism as a sequence of perceptual responses. This mechanism must then decide upon a plan of action and passes a sequence of demands on to the effector mechanism. The effector mechanism organizes the response and sends the appropriate motor command to the muscular system. Marteniuk specifies that feedback plays an important role in movement execution, in that information about the behavior can be fed back into the effector mechanism allowing, if time permits, corrections to be made as the movement proceeds. Feedback information may also be routed to the perceptual mechanism. Since this feedback loop is longer than the effector feedback path, more time for processing is necessitated; if the movements were long enough, this information may still be used to correct the later parts of the total movement. External feedback provides the performer with information of performance outcome, which may serve an economical function in successive performance trials (Marteniuk, 1976, p. 5-6).

Over the years several theorists elaborated upon the notion of information processing with relevance to the processes underlying skill acquisition (Broadbent, 1958; Fitts, 1964; Gentile, 1972; Williams, 1973; Robb, 1974; Marteniuk, 1976). Fitts (1964) described skill acquisition

in three stages:

(i) the cognitive phase in which the learner seeks to understand the task and to develop an approximate strategy,
(ii) an associative phase in which stimulus-response (S-R) links are established, and
(iii) the autonomous phase in which motor patterns are refined and integrated and in which voluntary control tends to drop out (Annett, 1971, p. 267).

The working model proposed by Gentile (1972) identified two stages of skill learning. The initial phase of learning a skill was referred to as the "getting the idea of the movement" phase. This entailed the organizational procedures of determining which motor pattern would be effective in producing a particular outcome, restricting it and controlling it, as a motor plan inherently related to the goal. Thus, the temporal organization of spacial components within the motor pattern - the syntax of movement - was preconceived and was used to guide movement execution (Gentile, 1972, p. 607). The second stage of skill acquisition was denoted by Gentile as "fixation/diversification". This stage followed the establishment of a general motor pattern and subsequently the orientation of the learner was to refine, retain or alter the motor pattern to reach a particular level of skill (Gentile, 1972, p. 11).

A slight adaptation to Fitts' (1964) original concepts

of skill acquisition was proposed by Robb (1974). This theory submitted that there were three stages of skill acquisition: (i) plan formation, (ii) practice, and (iii) automatic execution. Each phase of the skill, by design, was broken down into possible components or sub-units. Therefore, if a student's response demonstrated that a particular sub-unit was accomplished, then the student was ready to proceed to the next step. Conversely, if a sub-unit was not accomplished, then the instructor must take further steps to assist the learner in accomplishing the missing sub-routine (Robb, 1974, p. 94-97). This researcher based her model on the premise that there was a serial ordering or sequential organization of components within tasks. The implications for instructional theory necessitate teacher awareness of the sequential organization of task sub-routines. Temporal organization was the term used in reference to the interval between successive sub-routines. This model, proposed by Robb, was supportive of the cybernetic approach, whereby mental practice of whole or part of the sub-routines was identified as an essential organizational procedure prior to automatic execution (Robb, 1974, p. 100). This theory of information processing, with its practical implications for instruction, will be of significance later in this study.

The notion of modularization as proposed by Bruner (1973) touched upon the components of the model of skill acquisition proposed by Robb (1974). With regard to the development of skill competence in infants, Bruner maintained that three themes were central to learning: intention, feedback and the patterns of actions which mediated between them. It was speculated by Bruner that his theory of modularization was highly similar to other theories of information processing. By definition:

> Modularization frees available information-processing capacity for further use in task analysis, by virtue of constituent sub-routines requiring less attention..... This mechanism makes possible the achievement of a serial order in behavior through a "feed forward" loop. The act gradually becomes less variable in latency and in execution time and more economical in expenditure of energy (Bruner, 1973, p. 4-5).

This theory of the organization of early skilled action, as presented by Bruner (1973) may, in principle, appear to have had substance; however, it was lacking in the depth and complexity of design demonstrated in the other models previously mentioned.

The Contribution of Feedback to Skill Learning

The interrelationship between feedback and processes of motor learning has been extensively reviewed (Bruner, 1966; Fitts and Posner, 1967; Bilodeau, 1969; Annett, 1971).

Fitts and Posner (1967) have distinguished two basic forms of feedback: "intrinsic" or kinesthetic information arising from within the body which occurs naturally as a consequence of movement; and "extrinsic" feedback which arises from environmental cues such as a score or experimenter evaluative comments. According to Annett (1971) any feedback, other than intrinsic, is termed augmented feedback. It has been a rarely disputed fact that feedback is one of the most crucial variables affecting learning (Bilodeau, 1969; Annett, 1971; Robb, 1974; Wall, Watkinson and Shatz, 1979).

Augmented feedback may be concurrent or terminal, the latter being more frequent when a discrete response was made, and corrections of significance to the desired response were directed back to the subject. Annett (1971) stated: "The principle findings on terminal feedback with respect to discrete motor responses concern three main variables: frequency, precision and timing". This may have been founded upon the works of Bilodeau who, in 1969, distinguished the following as significant points for consideration:

> (i) the temporal relationship of feedback to the response,
> (ii) the nature or form of the feedback, and
> (iii) whether feedback followed each response or was presented cumulatively
>
> (Bilodeau, 1969, p. 257).

The commonly accepted generalization that the more precise the feedback the better the learning may not necessarily be true (Annett, 1971, p. 268). A paper prepared for the analysis of individualized instruction indicates that specific information feedback of some type was necessary to help the learner see ways of improving skill, but once learning has occurred responses may be maintained through general feedback of a positive nature (Wall, Watkinson and Shatz, 1979).

It has been widely stated that extrinsic feedback serves three distinct functions: informative, reinforcing and incentive. The information function is corrective in the sense that its effect is to persuade the subject to vary a subsequent response. This may be of particular importance in the early stages of learning a motor skill. Over episodes, this feedback may consistently inform the learner of progress toward the final task objective. A shift from extrinsic to intrinsic reinforcement is desirable, over episodes, consequently the level of learner dependence would be decreased.

Motor Performance fo the Mentally Retarded

Information from a number of sources indicates that

mentally retarded children are motorically deficient in areas of physical fitness, fine and gross motor skills. Bruininks (1974) states:

> As the severity of the intellectual defect increases, motor function correspondedly decreases. Deficits in performance of retarded compared to non-retarded subjects became progressively larger with age (Bruininks, 1974, p. 248).

Analysis of performance patterns shows that motor performance of retarded persons is most impaired on measures which require:

a) a high incentive motivation for optimum performance;

b) conceptual understanding of movement patterns demanding a sequence of responses;

c) movement patterns requiring simultaneous or sequential integration of various senses or body parts (Bruininks, 1974, p. 248-249).

According to Wall (1976), an essential step in learning complex motor skills is the development of an understanding of what one is expected to do in a given perceptual motor task. As previously mentioned, Gentile (1972), has labelled this early stage of motor skill acquisition the "getting the idea of the movement" phase. Mentally retarded children, by definition, are impaired

in their cognitive verbal abilities; and recent studies have indicated that mentally retarded persons have short-term memory deficits and thus experience considerable difficulty in identifying and then attending to the salient features within a stimulus display (Zeaman and House, 1963; Ellis, 1970; Brown, 1975; Wall, 1976). Due to the limitations expressed above, mentally retarded children are thus handicapped in the critical "getting the idea of the movement" phase (Gentile, 1972) or "plan formation" phase (Robb, 1974) of skill acquisition. Wall (1976) suggests the implications of this processing deficit by stating:

> Mentally retarded pre-school children have difficulty observing the salient features in a catching task and cannot rely, to the same extent as non-retardates, upon verbal cues to develop an understanding of what they are expected to do. Thus, they can not adequately model the motor performance of others and from a very young age retarded children are handicapped in the opportunities for practice naturally presented by the environment (Wall, 1976, p. 76).

Implications for Instruction

Many interacting variables have been noted as factors contributing toward motoric deficiencies within mentally retarded populations. Keeping patterns of motor development in mind, researchers have designed programs to facilitate motor skill acquisition within developmentally delayed populations. The use of stimulus and response prompts, guidance, shaping and fading procedures and imitation strategies has been incorporated into many special curriculum programs for use with atypical children (Wessel, 1975; Kysela et al, 1976; Bender and Vallentutti, 1976; Watkinson, 1976; Wehman, 1979).

Although observation, assessment and skill selection are important steps of preintervention, the instructional techniques utilized are critical to the success of any motor skills program. Recently, remedial programs, geared to service mentally retarded and disabled individuals, have been founded upon principles of applied behavior analysis.

Kysela and Hillyard (1978) defined applied behavior analysis within an educational setting in the following manner:

> Applied means that the behavior under study is important in terms of society's educational goals. Behavior refers to the objective definition and measurement of a particular behavior under study and an evaluation of the reliability of the measurement techniques. Analysis refers to the process of assessing the influence of various treatment procedures upon a person's behavior
> (Kysela and Hillyard, 1978, p. 179).

"Task analysis refers to the process of analyzing the final instructional objective to determine the sub-skills the learner must possess to perform under the prescribed conditions to the specified standards." (Baine, 1978, p. 13). According to Baine, sound instructional programs can be designed through the administration of developmental tests which evoke the concept of readiness. These tests, termed criterion referenced tests, compare an individual's achievement to a sequence of instructional objectives. Baine specifies:

> These final objectives are analyzed into the necessary and sufficient sub-skills required to achieve each objective. The sub-skills are then described in terms of sub-objectives that are then listed into a sequence from simple to complex performance. Each sub-objective has standards or criteria that a performer must achieve to demonstrate that he has learned that particular sub-skill (Baine, 1978, p. 2-3).

Extensive investigations have been conducted to consolidate information with regard to criterion referenced measurement techniques and instructional tactics which

employ task analytic methods (Mager, 1962; Becker, Engelmann and Thomas, 1975; Pophom and Baker, 1970; Baine, 1978).

Wehman (1979) suggests that numerous advantages are present within a task analytic format of instruction. He stresses the value of task analysis in determining the optimal point of performance upon which instruction should commence. Task analysis also allows for a systematic means of evaluating the effectiveness of a program, as it allows for an objective measure of the number of steps taught and learned following intervention (Wehman, 1979, p. 39-40). The latter point will prove significant upon the analysis of instruction conducted within this study.

Instructional Programs Based Upon Task Analysis

Strategies of instructional intervention, specifically designed to compensate for the motor learning difficulties of special populations, have recently generated researcher interest. Wessel (1975) developed a model for teaching motor skills to elementary school aged mentally retarded children using an individualized approach. According to Knowles, Vogel and Wessel, the thrust of their efforts is twofold. Firstly, it is directed toward

preparation of instructional materials and secondly, it is directed towards professional preparation of teachers in both classroom and gymnasium environments (Knowles, Vogel and Wessel, 1975, p. 155-156). The teaching model suggests that the teacher follow six fundamental steps in order to effectively individualize instruction: 1) plan, 2) assess, 3) prescribe, 4) teach, 5) evaluate, and 6) modify. Although the curriculum was designed for use with retarded students, the diagnostic-prescriptive program and teaching model,with adaptation and modification may accommodate all learners. The design might serve as instructional resource materials that teachers could utilize in selecting of objectives according to goals and specific student needs (Knowles, Vogel and Wessel, 1975, p. 159).

The PREP program, which operates out of the University of Alberta, is an outgrowth of the I-CAN Curriculum. The central feature of the program is an ordered set of task-analyzed, instructional sequences designed to facilitate the assessment, selection and teaching of culturally-normative motor skills to mentally retarded children. Each instructional sequence consists of criterion-referenced performance objectives which specify increasingly skillful behavior on a given motor task (Wall, Watkinson and Shatz, 1979, p.1).

The program materials illustrate a model which uniquely combines freedom and choice in play with skill instruction. By design, the children are free to play at whatever level of sophistication they are capable of, to be interrupted only at well chosen moments for instruction in prescribed activities. The target skills of instruction are broken down into component processes so a basic learning sequence of instruction is established. A second level of progression is built into the instructional sequences through the use of a response prompting continuum; with the intent being a reduction in teacher assistance as the child's skill level increases (Wall, Watkinson and Shatz, 1979, p. 4). The PREP program model is further elaborated upon in subsequent chapters.

Initially, the PREP program objectives were designed to meet the needs of pre-school aged moderately mentally retarded children. However, in 1976, PREP program materials were evaluated for use with severely mentally retarded children. It was found that the task analyzed instructional sequences did not function to provide for optimal motor learning within the sample population. Essentially, the investigation established a need for further decomposition of existing instructional sequences into attainable task steps and the development of new task

analyzed instructional sequences for fundamental locomotor skills. The investigation resulted in the formulation of curriculum materials for gross motor skill instruction for severely mentally retarded children. The PREP-PRIMER program, although in the initial stages of development, reflects an effort to upgrade instructional strategies and facilitate optimal skill learning (Wall, Watkinson, Friesen, Shatz, Hoy, Hunt, 1978).

A service program directed toward early intervention with the families of moderately and severely handicapped children was developed by Kysela in 1976. The Early Education Project employed a behaviorally-based developmental curriculum which specified instructional objectives designed for children from birth to six years of age. The curriculum serves as the basis for a criterion-referenced assessment procedure designed to depict the learner's level of competency. The instructional program focused upon five areas of development: language, motor, cognition, self-help, and socialization, with instruction being conducted in the home or in a school based early education classroom. The program model advocated test-teach methods for direct and incidental instruction. Learner progress was monitored consistently in both environments, thus providing objective data for analysis of the effectiveness of instruction (Kysela, 1976).

Reliability Estimates in Applied Behavior Analysis Studies

Kazdin (1977) defines accuracy as the extent to which observations scored by an observer match those of a predetermined standard for the same date (Kazdin, 1977, p. 141). Although the accuracy of observations is often inferred from the measure of interobserver agreement, they are unified by definition. Interobserver agreement reflects the extent to which observers agree on scoring behavior (Kazdin, 1977, p. 141).

The method of measuring interobserver reliability of behavioral data, established by Bijou et al. (1969) employs the following formula:

$$\frac{\text{agreements}}{\text{agreements + disagreements}} \times 100 = \text{percentage of agreement}$$

An agreement is any interval in which both observers recorded that the response occurred during the interval. Disagreements are intervals in which only one observer recorded the response as occurring. Thus, every interval (behavior) is utilized in the calculation of inter-observer agreement, defined as the I-I method (interval-by-interval procedure) (Hawkins and Dotson, 1975, p. 306).

Complexity of Observational Coding and Systems Behaviors Scored

Complexity can refer to the number of different

> response categories of an observational coding system. Systems with more categories are more complex than those with fewer categories. Complexity may also refer to the number of different behaviors that are scored within a particular observation system on a given occasion (Kazdin, 1977, p. 144).

Thus, the higher the number of response categories and the greater the diversity of the behaviors scored within an observational system, the lower the inter-observer agreement.

Many sources of influence have been noted to bias reliability estimates. Listed among the variables which function to alter interobserver agreement and accuracy are: characteristics of the observational system, characteristics of the experimenter, observer and client, methods of scoring behaviors, the nature and duration of observer training, situational and instructional variables during assessment of reliability and concurrent observation of stimulus and consequence events (Kazdin, 1977, p. 143).

Kazdin concludes his production by suggesting that the theory of generalizability emphasizes the relative nature of reliability; that there is no reliability for a given assessment method, but rather an infinite number of reliabilities which are a function of the range of assessment conditions (Kazdin, 1977, p. 149).

CHAPTER III

DESCRIPTION OF INDIVIDUALIZED INSTRUCTION: INSTRUMENTATION

Development of the Instrument

The bulk of the instrumentation employed in this study was based upon research conducted by M. E. Whincup in 1978. The purpose of the Whincup study was to develop an accurate and objective observational instrument to describe behaviors exhibited within individualized instructional settings.

The setting selected by Whincup was the PREP Pre-school Play Program which was operated out of the University of Alberta. The observational instrument was designed specifically for the PREP Program to be utilized in three ways:

1) to monitor the teaching procedures and child achievement within the program,

2) to provide objective feedback to participating teachers, thus helping them to develop their own teaching skills,

3) to increase the research possibilities within the program. (Whincup, 1978).

The data, in the form of videotape recordings, was scored by the researcher (criterion observer) as well as three other observers trained specifically for that purpose. Whincup viewed the proceedings of individualized instructional episodes and established three major behavioral categories

for coding: antecedents, behaviors and consequences. A fourth category, termed subscripts, was included to describe all behaviors which occurred in association with the other categories. Included within the subscript category, were behaviors which indicated some degree of additional physical assistance by the instructor (e.g. manipulation, physical prompt, demonstration). Within the antecedent category, all behaviors emitted by the teacher were classified for coding as either mands or solicitations for: a specific skill response, a general motor response or attention. The behavioral category served to indicate learner response - thus coded and recorded as correct, incorrect, incomplete or a negativism. The consequence category had terms of reference which applied to both positive and negative teacher initiated behaviors which directly followed the learner response. These consequences may have been verbal or physical in nature or in the specific form of augmented feedback.

The results of the study exhibited generally high inter-observer agreement. Whincup proved successful in the establishment of a complex and highly informative tool for the description of individualized instruction.

Pilot Study

A pilot study was conducted in February of 1978. The purpose of the study was to describe and analyze teacher-student interactions in a program of individualized instruction. Criterion were established to facilitate analysis of the data provided by coded instructional episodes. This was to be used as a significant source of teacher feedback.

The teachers, who acted as subjects, were instructors in the PREP Play Program. At the time of data collection, the teachers had no knowledge of the purpose of the study. The motor skills under investigation were prescribed by the teacher, who, following assessment determined the skills lacking from the motor skill repetoire of the learner.

Data, in the form of videotape recordings, was collected over a period of three days of program operation. Four instructional episodes were randomly selected from a total of twenty. Each instructional episode was filmed from beginning to end. The behaviors of each instructional episode were coded under the following categories: Pre-instruction, Antecedents, Behaviors and Consequences (Whincup, 1978). Within each category, all teacher and student behaviors were observed, described and coded,

according to the behavioral definitions and respective coding key developed by Whincup (Whincup, 1978).

The visual product which resulted from the coded interactions was then further analyzed under the following basic criterion:

1) What pre-instructional measures were employed to structure the learning environment?

2) Did the teacher sufficiently "obtain" and "maintain" learner attention?

3) Was teacher assistance in the form of manipulation, physical prompts or verbal cues "faded"?

4) How many trials did the learner have on task? Were there any independent rehearsals?

5) Was there any augmented feedback information provided which was specific to learner performance?

6) What was the basis for ending the instructional episode? Was teacher timing effective?

The study provided fundamental descriptive information and an interesting insight into the influence of individual teaching styles upon a structured technique. No evaluative comparisons were made across teachers. The information which resulted from the study was not shared with the instructors until data collection for the master study was completed. When the feedback was provided, the instructors received it in a positive manner and it is hoped it acted as a catalyst for improved teacher performance.

Observational Instrument - Revised Format

A desire to isolate the crucial factors for optimal learning prompted Wall, Watkinson and Shatz to develop a model for the analysis of individual instruction within the PREP program. (Wall, Watkinson and Shatz, 1979).

The central feature of this descriptiive and analytical model was a systematic framework whereby the degree of teacher assistance could be faded within a continuum of response prompting. The researchers advocated a decrease in direct assistance by the instructor as the skill proficiency of the child was increased. As indicated in Figure 1, there were four categories of prompts, each comprised of three distinct levels of prompting. (Wall, Watkinson and Shatz, 1979, p. 5)

The PREP Model format for description of the interactions differed slightly from that produced by Whincup in 1978. Three major factors were isolated as essential for systemmatic learning: pre-instructional, instructional and post-instructional. Within the instructional category three distinct phases have been identified. The pre-response instructional phase was established to include the specific teacher behaviors which were utilized to prepare the learner for a successful skill response. The second phase of the

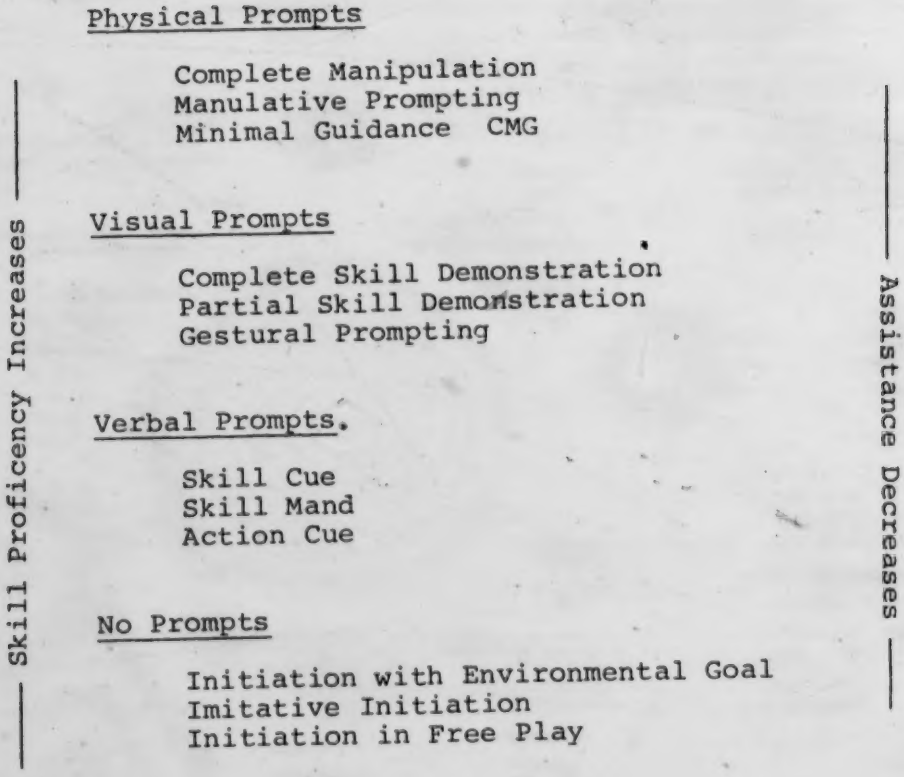


Figure 1. Instructor Assistance Faded Within the Response Prompting Continuum

adapted from (Wall, Watkinson and Shatz, 1979)

instructional episode was termed skill response: the phase during which the teacher must evaluate the learner's response in light of the desired response. Thirdly, the post-response instructional phase may be best described as the instructor's opportunity to provide information feedback related to the preceding performance. The feedback provided, by nature, may be general or specific and was customarily administered in order to ensure repetition and progression of skill responses. (Wall, Watkinson and Shatz, 1979)

This instrument was designed with the intent of providing teachers with succinct visual data pertinent to their teaching behaviors. The researchers recommended a videotape recording be taken of a sample teaching episode. Terms of reference were established for descriptive purposes and a corresponding code symbol was identified for each. (Refer to Appendix A). Rules for the coding and analyzing of the teaching episode were prescribed and the information on behaviors was depicted on a columnized coding form. (Appendix A). A set of questions, identified as being critical to the analysis of individualized instruction, were incorporated within this model as a viable source of teacher feedback.

CHAPTER IV

METHODS AND PROCEDURES

Introduction

This study unfolded in two distinct portions. During the first, through the implementation of a detailed observational instrument, all interactions between teacher and learner were observed and coded by behavior. Consequently, an elaborate yet specific description of each individualized instructional episode was prepared. The second portion of the research entailed a thorough analysis of the instructional episodes. Instruction on both discrete and continuous skills was investigated by means of the application of the established objective indices of the quality of instruction. The analysis of instruction was viewed on two levels. On a personal level, skill progress was critiqued in relation to the occurrence of interactions between the teacher and learner. Secondly, the indices were applied from a programmatic perspective. The researcher investigated the congruence between the observed practice of instructional strategies and that of the specified techniques according to the PREP manual instructional materials.

The subjects of the study were four female teachers and their eight male students, all of whom participated in the PREP Play Program, operated by the Department of Physical

Education within the University of Alberta.

Videotape recordings of individualized instruction were taken each day over a period of ten instructional days. Following the completion of data collection, each instructional episode was observed and coded thus providing a composite description of the entire episode.

Fifteen percent of the data was then randomly selected and scored as a measure of inter-observer agreement. (Appendix C)

The data was then analyzed and discussed according to the predetermined indices of the quality of instruction.

Sample

There were eight male children who participated as students in this study. All the children, at the time of the investigation, were enrolled as students at Sir Winnifred Stewart School, Edmonton, Alberta. As a portion of their educational program, the children participated three mornings weekly in the PREP Play Program, a motor-based instructional program operated through the University of Alberta, Department of Physical Education.

The chronological age range of the subjects was five

to nine years. The level of intellectual functioning of each subject was stated as being within the range of moderate mental retardation. None of the children had any physical disabilities which would impede instruction in gross-motor skills. Further details on each child who participated in the study may be located in Appendix D.

The teachers who served as subjects of this study were all selected teaching staff of the PREP Play Program. All teachers had been previously trained in PREP procedures of assessment and instruction. Two of the teachers were completing their final year of study in Special Education and the remaining two were completing their third year of study in Physical Education.

The students had been allocated to the teachers by administrative procedures uncontrolled by this study. Each teacher selected two students, from those in their care, for the pruposes of this investigation. Similarly, the skills of instruction were selected by each teacher based upon the assessment-prescription procedures as indicated in the PREP manual. (Watkinson, 1976).

Environment

This study, in its entirety, was conducted within the PREP Play Program based on the University of

Alberta campus. At the time of program establishment, in 1972, five major objectives were defined; these included the development of:

1) suitable gross-motor play instructional materials for pre-school moderately mentally retarded children,

2) appropriate teaching strategies to use with the above program materials,

3) information on the design of equipment and apparatus within the playroom environment,

4) teacher training programs for university students and in-service training programs for professionals in the field, and

5) a demonstration center providing a direct service to a selected group of children in the community (Watkinson and Wall, 1977).

The nucleus of the PREP Program is an ordered set of task-analyzed instructional sequences designed to facilitate the assessment, selection and teaching of culturally-normative motor skills (Watkinson, 1976). Each instructional sequence consists of criterion referenced performance objectives which specify increasingly skillful behavior on a given motor task (Wall, Watkinson and Shatz, 1979).

The program model is designed to entice the learner to engage in purposeful play, exhibiting progression in both the quantity and the quality of play skills, over time. The instructional strategies employed in PREP reflect the integration of information from the human motor performance and applied behavior analysis models. Target skills, which are selected for instruction, are interjected by the instructor at carefully selected moments during each child's free play (Watkinson, 1976).

Diagram 1 depicts the physical organization of the PREP room, indicating the location of the major pieces of apparatus and the camera site from which filming was conducted.

Time and Duration of the Study

The data for the pilot study was collected on the 13th, 15th and 17th day of February, 1978.

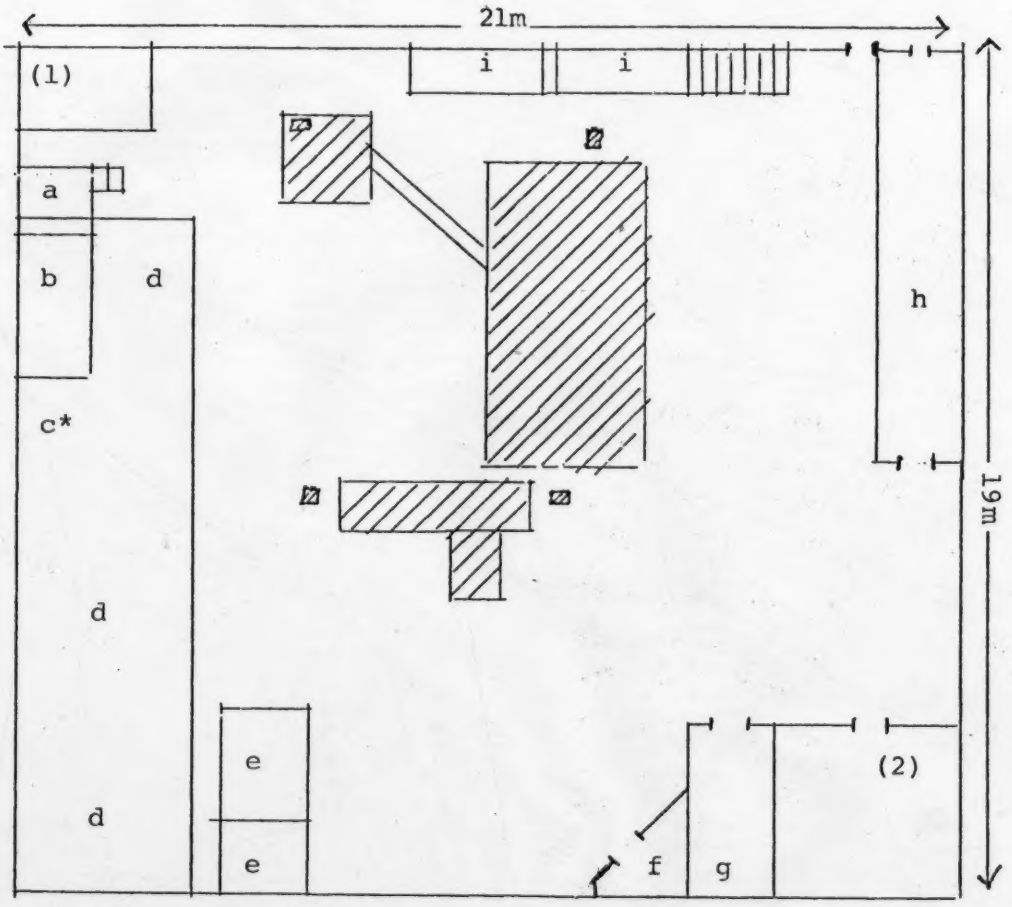
The collection of data for the major study commenced on the 5th day of April, 1978 and concluded on the 26th day of April, 1978.

Equipment

At the time of data collection the PREP room was a well equipped play room with apparatus and equipment suitably

PREP ROOM

Diagram 1



▨ - support pillar

▨ - climbing apparatus

⊣⊢ - door

1 - platform

2 - office

a - steps and platform to trampoline

b - trampoline

c - climbing rope (*suspended from ceiling)

d - large mat (4m x 15m)

e - scotter ramp

f - play house

g - washrooms

h - observation room (one way mirror camera area)

i - large slide (2m ladder, 3m platform, 3m long slide)

arranged so as to be conducive to diverse forms of play (Diagram 1). There was ample equipment, both stationary and portable in nature, to stimulate skills of locomotion, body control, object control and the more complex higher order tasks.

The equipment used in the skills of instruction for this study consisted of: a trampoline, a heavy rope suspended from the ceiling, a low bench, two tricycles, a ball, a bat, a cone cylinder, one skip rope, two hoops, a horizontal bar with two supports and a large mat.

Collection of Data Procedures

There were four teachers and eight students who participated as subjects in this study. In order for the instructional interactions to occur in the most natural manner, the researcher deemed it necessary that PREP instructors have no notion as to the true purpose of the investigation. It was anticipated that modifications in teacher behaviors and/or expected learner outcomes may result from instructors having prior knowledge of the research.

Videotape recordings were collected of instructional episodes over a span of four weeks: ten days of instruction.

Data was collected on Monday, Wednesday and Friday mornings in conjunction with the scheduled events of the PREP program during that period.

For the purposes of this study, a daily chart was posted within the camera area which randomized the order of teacher-learner episodes for filming. Each instructional episode was videotaped in its entirety.

It was the wish of the researcher that the observations be as unobtrusive as possible. To reduce reactivity, the VTR unit was located in the adjacent observation room (see Diagram 1) and the filming was conducted through a one-way mirror. The low light camera utilized was a Panasonic AVMC 130 Serial WV 361. The video recorder unit was a Sony Solidstate AV 3600 accompanied by an Electrohome monitor model AVMC 146. The auditory portion of the interactions was recorded through the use of a Lectrosonics M30 Voice Projector unit. This device consisted of a small wireless microphone and a wireless M30 microphone transmitter and receiver. The tiny microphone transmitter was worn by the instructor and was fastened in an inconspicuous place on the clothing. The radio receiver was also carried in a pocket of the instructor. At no time did the children appear to notice or seem distracted by either the camera or the

microphone units.

Videotape samples were taken with the intention of following the development of one skill with each child over ten instructional episodes. Each teacher selected the target skills of instruction for the two children in her care, these skills to remain consistent for the duration of data collection. Prior to the first session of filming, each teacher specified the base from which they would be instructing, indicating the step within the task sequence and the response level in accordance with the PREP instructional materials. The teachers did not provide any instruction on the target skills on any morning prior to the videotaping of their respective episode. In some instances, slight modifications were made to the arrangements of apparatus to facilitate a clear line of vision for filming.

Each teacher selected a substitute student and specified their target skill of instruction in the event of absence due to illness on the part of one of the original subjects.

Coding Procedures

The model which was adopted for the observation of the data was designed by Wall, Watkinson and Shatz in 1979. (Outlined in Chapter III). The PREP model of instruction was

implemented in its entirety, thus the researcher chose to adhere to the established definitions of terms, rules for coding and code symbols. (Appendix A). For the purposes of this study, a slight modification was made to the recording form: provision was made for the recording of general feedback within the post-response category and a pause column was included to precede the response category. (Appendix A).

All seventy-two videotaped instructional episodes were viewed and transcribed as data onto the recording forms. The following is a composite of the instructional indices, the categories and their corresponding code symbols. A more complete description of the instrument and procedures for coding may be located in Appendix A.

Phase of Instruction	Symbol
A) Pre-instruction	
Desired Response	
Attention	A
Position	P
Execution	E
B) Pre-response	
Physical	
Complete Manipulation	CM
Manipulative Prompt	MP
Minimal Guidance	MG
Visual	
Teacher Demonstration	D (T)
Student Demonstration	D (S)
Partial Skill Demontration	PD
Gestural Prompting	G

Verbal	
Skill Cue	SC
Skill Mand	SM
Action Cue	AC

C) Response

Correct Response	C
Incomplete Response	I
Incorrect Response	X
Negativism	N

D) Post Response

Physical	
Complete Manipulation	CM
Manipulative Prompt	MP
Minimal Guidance	MG
General Feedback	GF
Visual	
Teacher Demonstration	D(T)
Student Demonstration	D(S)
Partial Skill Demonstration	PD
Gesture	G
Verbal Response	
Skill Cue	SC
Skill Mand	SM
Action Cue	AC
General Feedback	GF
Interruption	/
Pause	*

Inter-Observer Agreement Measures:

One other person, who was familiar with PREP instructional strategies, was trained for the purposes of an observer accuracy measure. Sixty-two instructional episodes were identified as meaningful data. Ten episodes (16.1%) of the data were randomly selected to be scored for measures

of inter-observer agreement. A standard of 80% was established as an acceptable level of agreement.

The videotaped instructional episodes which were disregarded as data were used as training tapes. These instructional episodes were determined meaningless data due to the fact that they represented incidental instruction, a substitute sample taken in the absence of one of the original subjects.

A training packet was compiled. (Appendix A). This consisted of the following information:

1) A list of the phases of instruction, the indices of instruction and their corresponding code symbol
2) Definitions of terms
3) Rules for coding of instructional episodes
4) Self-testing exercises, with answers:
    1) Exercise I - Identification of code symbols.
    2) Exercise II - Identification of words, phrases, and sentences customarily describing interactions.
    3) Exercise III - Identification of behaviors within two episodes - one continuous and one discrete skill.
5) A transcript of a sample instructional episode, accompanied by the corresponding completed recording form. (Adapted from Whincup, 1978)

The duration of the training period for the observer was 8 hours, conducted in three sessions, over a period of one week. The viewing of the selected instructional

episodes was made possible by use of a Sony Solidstate Videorecorder Model AV 8600 accompanied by an Electrohome TV contract series.

In the initial training session, an explanation of the study was provided and the training packet was presented and freely discussed. A pre-view of three video recordings to be used for training purposes was observed. The observer was then requested to complete the three self-testing exercises included in the training packet. Upon completion of the testing exercises, the answers were provided and each item was discussed. Subsequent training sessions involved both parties independently scoring instructional episodes from the training materials. The completed recording forms were compared and discussed, the problem areas were identified, definitions were clarified and ground rules for coding were reinforced. The researcher was confident the observer clearly understood the instrumentation, when a high level of agreement, over 90%, was repeatedly evident as the recording forms were compared. Training was terminated following the third session and the coding of the data commenced.

The observer was provided with the following materials for the purpose of coding:

1) Coding forms.

2) Pencils and an eraser.

3) Written materials which identified each instructional episode, stated the skill and indicated the cues to commence and cease coding.

4) A list of coding rules and procedures.

5) The videotapes bearing the ten instructional episodes to be coded.

The coding of the ten episodes was completed in five sessions over a ten day period. The researcher was present on each occasion of observer coding.

The coded data was investigated for a measure of observer reliability. The percent inter-observer agreement was caluclated through the implementation of the following formula:

$$\frac{\text{Number of agreements}}{\text{Number of agreements + disagreements}} \times 100.$$

Detailed information on inter-observer agreement measures is presented and discussed in Chapter V and Appendix E.

Instrument of Data Analysis

Development of the Instrument

An observation of the data presented in the pilot study (described in Chapter III) prompted the researcher to isolate some key factors which repeatedly contributed to a successful instructional episode. Invariably, on occassions where the behaviors identified were not evident, learner response on successive trails was poor. The questions which were developed for analysis in the piloting phase of this research and the insights which they generated, acted as a catalyst for further development of an instrument to objectively analyze individualized instruction.

The paper prepared by Wall, Watkinson and Shatz in 1979 established valuable guidelines whereby instructors could analyze their own teaching behaviors and thus identify personal strengths and weaknesses in the quality of their instruction. The authors recommended that instructors code a sample teaching episode through the implementation of the descriptive instrument elaborated upon in Chapter III. Each coded episode should then be evaluated by means of answering explicit questions designed to isolate interactions within all phases of instruction. The

interrelationships between the fading of assistance within the response prompting continuum and learner responses at each level would be investigated thus generating pertinent information for consideration. By design, instructors would also be made aware of the degree of specificity of feedback information which would customarily be afforded the learner.

Indices of the Quality of Instruction

For the purposes of this study, the researcher has chosen to implement an analytical model much in keeping with the content of that produced by Wall, Watkinson and Shatz in 1979. An objective analysis of the teaching behaviors of the four participant instructors will be conducted.

The procedures of instrumentation will be characterized by notation of recorded behaviors in three specific dimensions. This format was designed to have equal validity for application towards continuous and discrete gross motor skills. Although it has been recognized by the researcher that analytical discrepancies may be evident with regard to the fading of instructor assistance in continuous skills, due consideration was given and relevancy was established. (Discussed in Chapter V).

The isolation of crucial information on instructional intervention was facilitated by the application of the following indices:

1) Calculation of percentage of correct learner responses for attention, position and execution over episodes of instructions.

2) Measurement of instructor assistance provided: According to response prompting continuum, note fading of assistance a) within each episode, b) over series of episodes, c) in relation to corresponding percent correct learner response.

3) Status of feedback information provided learner in post-response instructional phase: calculated percent specific feedback, percent general feedback, percent occurrence no feedback provision - over episodes.

The information tabulated through the application of the indices is presented and discussed in Chapter V.

Information presented as percent frequency of occurrence.

CHAPTER V

RESULTS AND DISCUSSION

Introduction

The presentation of the results representing the analysis of the data will unfold in the following manner. Firstly, since the instrument of observation and analysis was designed as an accurate and objective means of describing instructional interactions, it was felt by the researcher that the presentation of observer accuracy measures was fitting. Thus, the calculated information on percent inter-observer agreement will be presented and briefly discussed.

The second portion of this chapter will deal with individual results. Pertinent information on specific instructors and learners, over episodes, will be depicted systematically. A critical analysis of specific teacher behaviors and learner responses will be conducted. The strategies of individual instructors will be discussed in view of the indices of the quality of instruction.

In the final section of this chapter, the strategies of the instructors will collectively be discussed from a programmatic perspective. The researcher will consider

the congruence between observed and recorded practices of instruction and the instructional techniques proposed in the PREP manual.

Inter-observer Agreement

The calculated inter-observer agreement for each instructional phase is presented in Table 1. Sixty-eight disagreements were recorded in a total of 505 observed behaviors. Over-all, the percentage inter-observer agreement was an acceptable 86.53%. The highest frequency of disagreemnts (27 occurrences) was evident in the physical response category within the pre-response instructional phase. The second highest source of disagreement (15 occurrences) was observed in the learner response phase. Cumulatively, these two behavioral categories represented 61.76% of all recorded disagreements. The percent observer agreement evident in the six remaining categories was significant, in that all scores exceeded the pre-established standard of 80%. The highest percent agreement was noted in the verbal category within the pre-response instructional phase. A more explicit breakdown of the categories of inter-observer agreement may be found in Appendix E.

TABLE 1

INTER-OBSERVER AGREEMENT FOR EACH INSTRUCTIONAL PHASE

CUMULATIVE OVER ALL INSTRUCTIONAL EPISODES

Phase of Instruction	Agreements	Disagreements	Percent Inter-Observer Agreement
Desired Response	86	4	95.5
Physical Response	33	27	55.0
Pre-response Visual	46	11	80.7
Pre-response Verbal	89	3	96.7
Response	74	15	83.1
Post-response Physical	19	6	76.0
Post-response Visual	1	0	100
Post-response Verbal	86	2	97.7

The high frequency of disagreements depicted in the physical response category reflects difficulty in the distinction of levels of instructor assistance. This was most commonly noted in episodes of instruction on continuous skills (i.e. trike riding, rope swinging). The fading of assistance was much less obvious when the child's body weight was being supported or physical contact maintained throughout the entire instructional episode.

Discrepancies were also evident in the area of skill response where evaluations had to be made as to whether the behavior was incorrect or incomplete. These disagreements occurred most commonly in the discrete skill of striking where the child would repeatedly swing the bat with proper action but miss the ball or hit the cone on which the ball was resting.

Individual Results

Introduction

The results for each subject are depicted in Tables II - XVII and Figures 2 - 9. There are three sheets of results representing data for each individual. The data, for description and analysis of individualized instruction, is presented as a unit in order to provide a composite view of all instructional interventions.

The first table of each unit provides information describing all teacher behaviors in the pre-response instructional phase. The percent frequency of occurrence of each behavior is depicted over successive episodes. The calculated precentage figures are to be read horizontally for each day of instruction. The precent frequency figures represent the occurrence of the specific teacher behaviors within trials of each episode. These behaviors may have appeared in isolation or in combination with other behaviors within instructional trials. For the purposes of analysis, this information will be regarded in conjunction with the fading procedures of the response prompting continuum.

The figure, presented in each data set, will provide the reader with information relevant to learner responses. A percentage of correct learner responses, for each day

of instruction, is charted graphically for attention, position and execution.

The second table prepared for each unit represents a detailed analysis of information feedback, within each episode. The feedback provided was classified, by definition, as being specific or general and the percentage breakdown of each is documented. A calculated percentage of occurrence where no feedback was provided, within episodes, is also evident on this table.

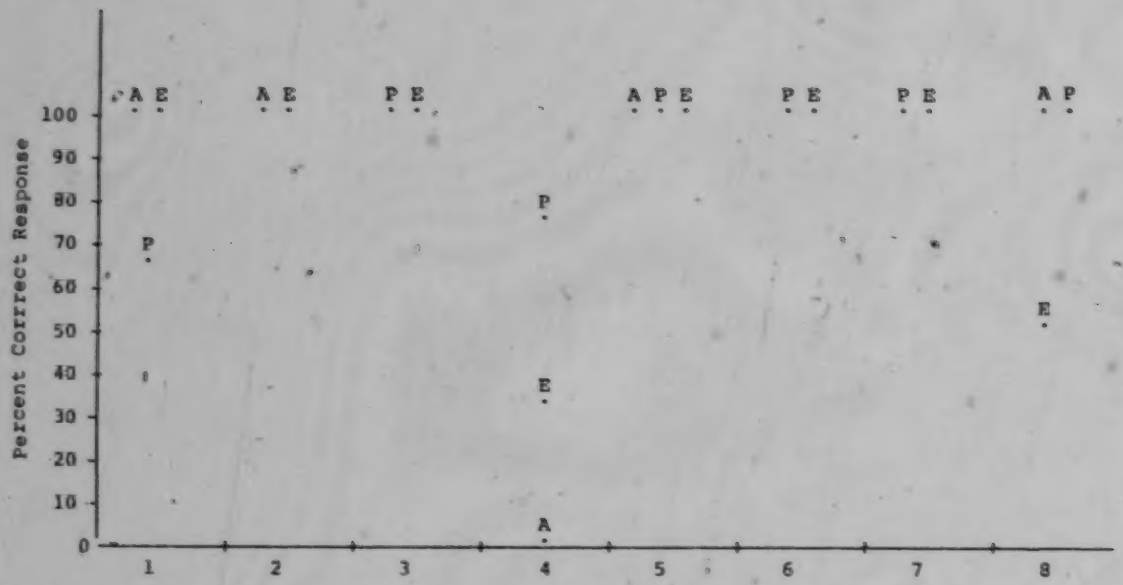
Following the presentation of each data set, significant points for consideration derived from the instructional indices, will be identified and briefly discussed.

TABLE II

Teacher A - Subject 1

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR CONTINUOUS SKILL - TO SWING ON A ROPE

Day of Instruction	Number of Trials	Percent Frequency of Teacher Behaviors									
		CM	MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	6	66.6	16.6	16.6							33.3
2	3	66.6									100.0
3	6	33.3	50.0					16.6	50.0		50.0
4	8	75.0	25.0					50.0	12.5		62.5
5	6	16.6	33.3	33.3				66.6	16.6	16.6	50.0
6	6	66.6		16.6				33.3			50.0
7	7	42.8	42.8	28.5				14.2	28.5		42.8
8	10	50.0	40.0		10.0			40.0	20.0	20.0	50.0



Day:			
1	A = 100.0%	P = 66.6%	E = 100.0%
2	A = 100.0	E = 100.0	
3	P = 100.0	E = 100.0	
4	A = 0.0	P = 75.0	E = 33.3
5	A = 100.0	P = 100.0	E = 100.0
6	P = 100.0	E = 100.0	
7	P = 100.0	E = 100.0	
8	A = 100.0	P = 100.0	E = 50.0

FIGURE 2

Teacher A - Subject 1

PERCENTAGE CORRECT LEARNER RESPONSE PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR CONTINUOUS SKILL - TO SWING ON A ROPE

TABLE III

Teacher A - Subject 1

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	6		100.0	33.3
2	3		100.0	33.3
3	6	46.1	53.8	
4	8	61.9	38.0	12.5
5	6	41.6	58.3	16.6
6	6	33.3	66.6	16.6
7	7	44.4	55.5	
8	10	44.4	55.5	

Teacher A - Subject 1

Points for Consideration:

Attention

1) The instructor demonstrated very little difficulty in obtaining and maintaining learner attention over instructional episodes. The learner performed correctly (100% response) on 4 of 5 occasions. (Figure 2).

2) Learner attention was most frequently attained through a teacher verbal prompt accompanied by a manipulative prompt.

Position

1) The learner required a high degree of instructor assistance in order to assume the correct pre-response position. Typically, on each trial, the learner had to be physically supported and completely manipulated while mounting the rope. General verbal feedback followed the response on each occasion.

Execution

1) Generally, the percentage correct responses for skill execution, was exceedingly high. There were only two occasions where learner response was not 100% correct (Figure 2). The continuous nature of the skill may account for the consistantly high performance exhibited. (Figure 2).

2) A high degree of physical assistance was afforded the learner. On all attempts the learner was either completely manipulated or physically prompted during skill execution. (Table II).

3) No fading of instructor assistance was evident within trials of each instructional episode.

4) No independent trials were attempted.

5) The instructor attempted to fade the level of assistance administered over episodes. This fading was not conducted systematically however, as is evident in episodes 4 through 8 (Table II).

6) Visual prompts, in the form of skill demonstrations, were rare. Gestures were provided in episodes 3 through 8.

7) Verbal prompts were generally in the form of action cues.

Feedback

1) The feedback which was provided was most often general verbal praise accompanied by a hug (general physical).

2) In 5 of 8 instructional episodes, trials where no feedback was provided, were recorded. (Table III).

3) The provision of specific feedback did not appear to have a significant effect on correct skill execution. (Figure 2).

General Discussion

The instructional strategies applied by Teacher A, on the task - to swing on a rope - proved rather successful. A high percentage of correct learner response was noted for all response categories (attention, position and execution). Due to the fact that the skill was continuous in nature, it was difficult to observe any increase in learner independence and skill proficiency. Although attempts were made to fade the amount of direct instructor

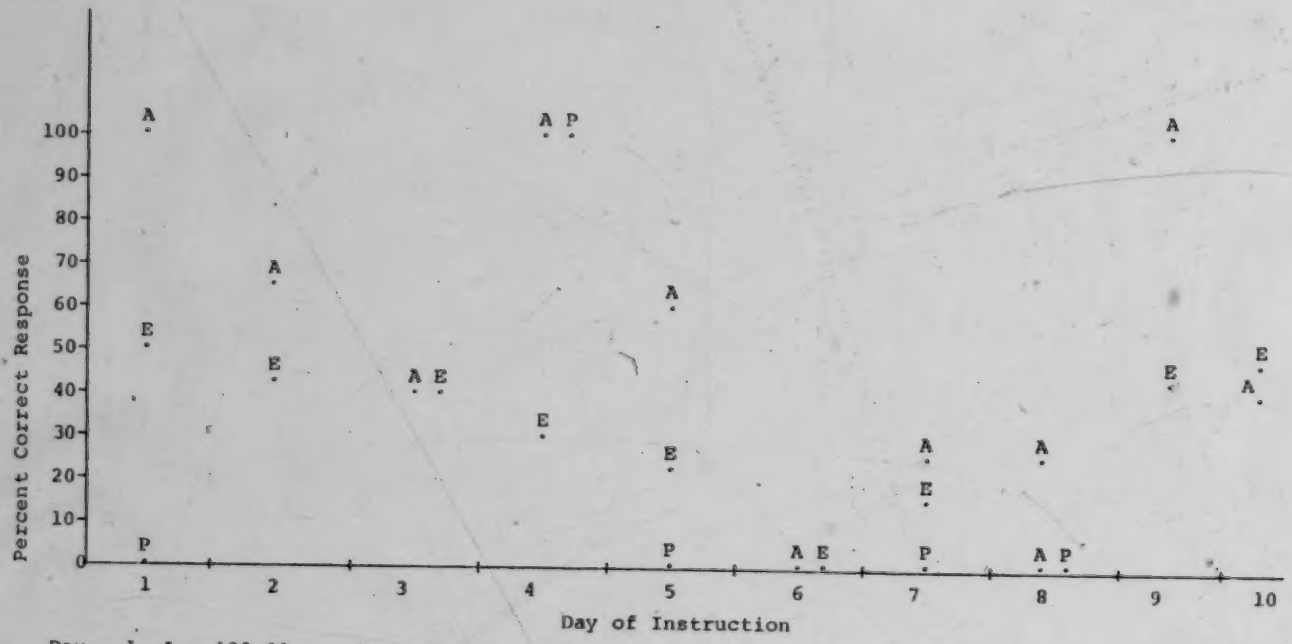
assistance, prompts were not systematically reduced. The feedback provided, although basically verbal in nature, was a mixture of general praise and reinforcement accompanied by knowledge of performance and knowledge of results. Instructor A was an enthusiastic, dynamic and supportive teacher and thus created a pleasant learning environment for Subject 1.

TABLE IV

Teacher A - Subject 2

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR DISCRETE SKILL - TO JUMP DOWN

Day of Instruction	Number of Trials	CM	Percent Frequency of Teacher Behaviors								AC
			MP	MG	D^T	D^S	PD	G	SC	SM	
1	10	70.0	10.0					20.0		30.0	40.0
2	12	58.3	25.0		58.3					66.6	16.6
3	15	60.0	26.6		33.3		20.0	26.6	6.6	66.6	6.6
4	13	53.8	38.4	7.6	61.5			30.7		100.0	
5	15	40.0	26.6		33.3			53.3	26.6	40.0	20.0
6	5	40.0	40.0		40.0				40.0	20.0	
7	11	81.8	9.0		45.5			18.8	9.0	45.4	18.1
8	9	88.8	11.1		33.3			11.1	33.3	33.3	22.2
9	16	31.2	18.7		37.5	12.5		25.0	6.2	43.7	18.7
10	16	68.7		6.2	25.0	56.2			6.2	31.2	31.2



Day:					
1	A = 100.0%	P = 0.0 %	E = 50.0%
2	A = 66.6	E = 41.6	
3	A = 40.0	E = 40.0	
4	A = 100.0	P = 100.0	E = 30.0
5	A = 60.0	P = 0.0	E = 22.2
6	A = 0.0	E = 0.0	
7	A = 25.0	P = 0.0	E = 16.6
9	A = 100.0	E = 41.6	
10	A = 40.0	E = 45.4	

FIGURE 3

Teacher A - Subject 2

PERCENTAGE CORRECT LEARNER RESPONSE PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR DISCRETE SKILL - TO JUMP DOWN

TABLE V

Teacher A - Subject 2

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	10		100.0	40.0
2	12	11.1	88.8	25.0
3	15	29.4	70.5	40.0
4	13	30.4	69.5	15.3
5	15	12.5	87.5	33.3
6	5	37.5	62.5	40.0
7	11	21.7	78.2	27.2
8	9	53.3	46.6	11.1
9	16	18.3	81.6	6.2
10	16	33.3	66.6	6.2

Teacher A - Subject 2

Points for Consideration:

Attention

1) Teacher A experienced a great deal of difficulty in achieving learner attention. A fluctuation in learner attending behavior is repeatedly evident over episodes. (Figure 3).

2) Learner attention was obtained either through complete manipulation (turning of head) or by frequent physical prompting. Attending responses were reinforced by general verbal comments.

Position

1) Only in 1 of 10 episodes did Subject 2 assume the correct pre-response position. On this occasion, 100% correct response was achieved through the complete manipulation of the learner. (Figure 3).

2) On fifty percent of the instructional days Teacher A did not attempt to have the learner assume the pre-response position. In 4 of 5 occasions the learner responded incorrectly to the prompts for pre-response position. (Figure 3).

Execution

1) Generally, the precentage of correct learner responses, over episodes, for skill execution was directly proportional to the degree of teacher assistance. (Table IV, Figure 3). Over the first 6 days of instruction, the amount of physical assistance (CM) was gradually reduced (from 70% CM to 40% CM). A corresponding reduction in the quality of performance was evident over days 1 to 6 of instruction, (50% correct response diminished to 0%).

2) Visual prompts, in the form of teacher demonstration and gestures were used extensively in the pre-response phase.

3) The verbal prompts category, depicted in Table IV, indicates frequent use of skill mands and action cues to stimulate learner response.

Feedback

1) The feedback provided the learner was most frequently in the form of a general verbal response (praise) accompanied by general physical contact (hug or tummy rub).

2) On each day of instruction, there were trials recorded wherein no feedback of any form was provided (the highest incidence being 40% in Table V).

3) Specific feedback, as knowledge of performance, was afforded the learner during the post-response phase in greatest frequency on days 6 and 9. (Table V). This appeared to have a subsequent positive effect on performance in successive trials.

General Discussion

Teacher A was not instrumental in bringing about successful responses in Subject 2 on the task of jumping. It is apparent, from data presented, that on no occasions, over 10 days of instruction, did learner performance (execution) exceed a 50% correct response. This may be due to the fact that Instructor A did not consistantly prompt for and maintain learner attention. Nor did this instructor have the learner assume the correct pre-response position, with the exception of one instructional episode.

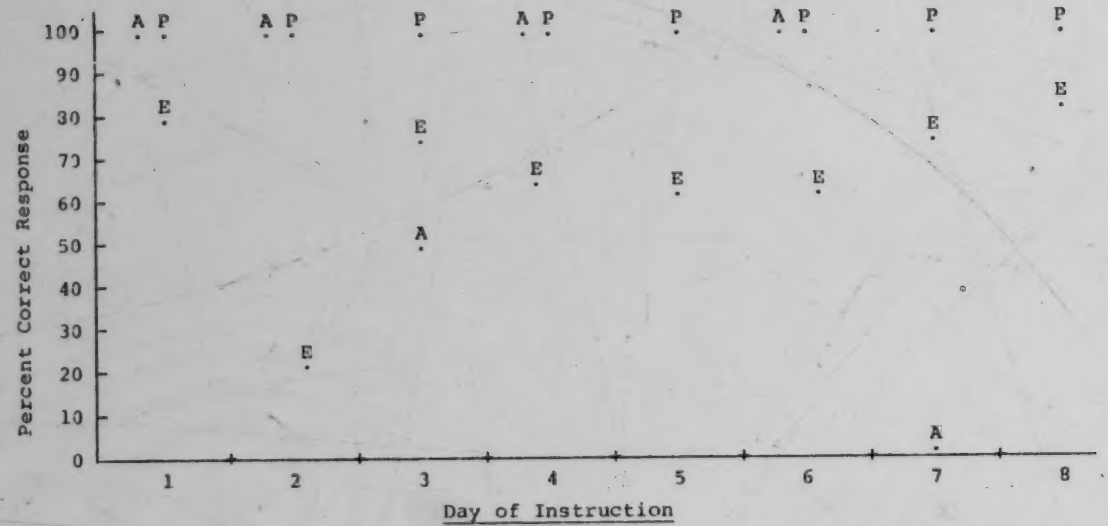
One would hazard to guess that if neither attention nor positional prompts solicited an acceptable response then the skill performance would be correspondingly lacking in quality. Although efforts were made, by Teacher A, to reduce physical, visual and verbal assistance, perhaps it was a bit in haste and consequently had a detrimental effect on learner response.

TABLE VI

Teacher B - Subject 3

Percent Frequency of Teacher Behaviors in Pre-Response Phase for Continuous Skill to Pedal a Tricycle

Day of Instruction	Number of Trials	Percent Frequency of Teacher Behaviors									
		CM	MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	7		28.5	57.1						85.7	14.2
2	7		71.4	28.5				14.2	100		
3	11		36.3	45.5				45.4	63.6		27.2
4	10		40.0	50.0				50.0	70.0		30.0
5	14		7.1	64.2	14.2				78.5		7.1
6	15	20.0	46.6	13.3				26.6	66.6		6.6
7	14	7.1	46.6	7.1				14.2	71.4	14.2	14.2
8	17	5.8	35.2	5.8					82.3		11.7



Day				
1.	A = 100%	P = 100%	E = 80%
2.	A = 100%	P = 100%	E = 20%
3.	A = 50%	P = 100%	E = 75%
4.	A = 100%	P = 100%	E = 62.5%
5.	P = 100%	E = 61.5%	
6.	A = 100%	P = 100%	E = 61.5%
7.	A = 0%	P = 100%	E = 75%
8.	P = 100%	E = 81.2%	

FIGURE 4

Teacher B - Subject 3

Percentage Correct Learner Response Plotted for Attention, Position and Execution for Continuous Skill to Ride a Tricycle.

TABLE VII

Teacher B - Subject 3

Percent Specific and Percent General Feedback and Percent Occurrence no Feedback Provided.

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurence No Feedback Provided
1	7	46.1	53.8	
2	7	43.7	56.2	
3	11	54.2	45.7	
4	10	67.6	32.3	
5	14	67.1	32.8	
6	15	64.0	36.0	
7	14	65.2	34.7	
8	17	54.6	45.3	5.8

Teacher B - Subject 3

Points for Consideration:

Attention

1) The data presented in Figure 4 suggests that Teacher B experienced very little difficulty in obtaining learner attention. On the third day of instruction, learner attending behaviors were reduced to 50% which may be associated with the decrease in manipulative prompting from 71.4% frequencey to 36.3% (Table VI) on that same day.

2) Learner attending behaviors were most often reinforced by general verbal and general physical teacher initiated responses, (head rub accompanied by praise).

Position

1) Due to the continuous nature of the task; once the tricycle was mounted and feet and hands were suitably placed, correct position was established. As graphically presented in Figure 4, Subject 3 experienced little difficulty in preparing himself for skill execution.

2) The learner was reinforced verbally when correct position was assumed. Specific skill cues relating to mounting and foot placement acted as the source of information feedback.

Execution

1) Correct skill performance, over 8 days of instruction was increased only by 1.2% from the first to the eighth day of instructional intervention. Over episodes, the teacher instructed consistently at the same step in the task sequence with the same degree of assistance on consecutive trials.

2) No independent trials were attempted by the learner.

3) No real pattern of fading of assistance in either physical or verbal prompts was exhibited over episodes. (Table VI). Generally, a low level of complete manipulation was apparent as skill responses were achieved through prompting and minimal guidance.

4) With the exception of gestures, no visual prompts were used for instructional purposes.

5) Skill cues were highly utilized in both pre and post-response phases and were not faded or delayed over episodes. (Table VI).

Feedback

1) Teacher B provided the subject with a constant mixture of general and specific reinforcement. Generally there was a higher percentage of specific information provided the learner, over episodes. This specific feedback contribution was most often as knowledge of performance through the verbal usage of skill cues. (Table VII).

2) Increases in the amount of post-response specific feedback did not appear to correlate to skill performance with any consistency. (Table VII, Figure 4).

3) Essentially, in every trial within each episode, the learner response was followed by some type of feedback. Only on the final day of instruction was there a response which was not followed by any information feedback. (Table VII).

General Discussion

Teacher B was very consistent in her instructional manner. She repeatedly provided the same skill and action cues in pre and post-response instructional phases.

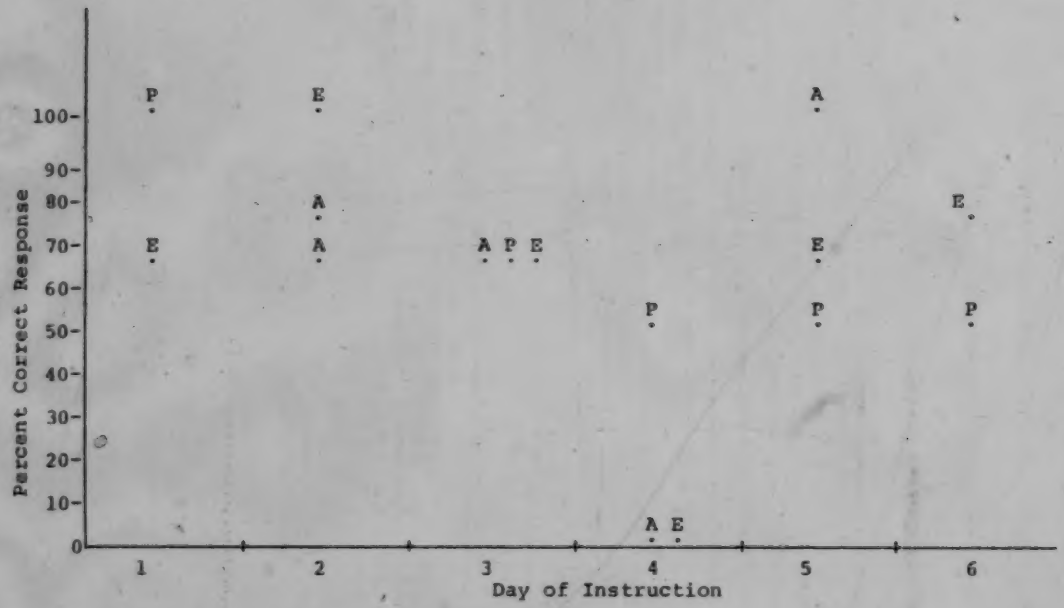
Feedback was seldom varied and constantly of the same intonation. Instruction was conducted on the same task step, at virtually the same level of assistance over 8 consecutive episodes of instruction. On no occasions did the instructor probe ahead on the task sequence, or afford the learner any independent trials. The skill proficiency of the learner did not increase significantly over the entire period of instruction (1.2% increase in correct responses for execution) over 8 days. It would appear that learner responses were consistent within 10 percentage points over episodes and perhaps the instructor should modify or vary the strategies of intervention to foster greater learner independence.

TABLE VIII

Teacher B - Subject 4

PERCENT FREQUENCEY OF TEACHER BAHAVIORS IN PRE-RESPONSE PHASE FOR CONINUOUS SKILL - TO HANG INVERTED ON A BAR

Day of Instruction	Number of Trials	CM	Percent Frequencey of Teacher Behaviors								
			MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	5	60.0	40.0						20.0	20.0	60.0
2	10	70.0	30.0								50.0
3	9	66.6	33.3					11.1	33.3	55.5	
4	7	71.4	28.5						71.4		
5	11	72.7	27.2						63.3		9.0
6	6	83.3	16.6						50.0	33.3	



Day:						
1	A = 100.0%		E = 66.6%			
2	A = 66.6		P = 75.0		E = 100.0%	
3	A = 66.6		P = 66.0		E = 66.6	
4	A = 0.0		P = 50.0		E = 0.0	
5	A = 100.0		P = 50.0		E = 66.6	
6	P = 50.0		E = 75.0			

FIGURE 5

Teacher B - Subject 4

PERCENTAGE CORRECT LEARNER RESPONSE PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR CONTINUOUS SKILL TO HANG INVERTED FROM A BAR

TABLE IX

Teacher B - Subject 4

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	5	16.6	83.3	20.0
2	10	40.7	59.2	10.0
3	9	76.1	23.8	
4	7	65.0	35.0	42.8
5	11	59.4	40.5	9.0
6	6	69.6	30.3	

Teacher B - Subject 4

Points for Consideration:

Attention

1) The instructor administered manipulative prompts in order to attain learner attention. Only on the fifth day of instruction did the learner response for attention reach 100%. (Figure 5).

2) The data depicting the fourth instructional episode (Figure 5) denotes extremely low percentage correct learner responses for attention. Consequently, the responses for skill execution were similarly poor.

3) Correct attending responses were customarily reinforced by general verbal praise.

Position

1) The learner required a high degree of instructor assistance in order to assume the correct pre-response position. Typically, the learner demanded complete physical support when taking on the inverted position. Manipulative prompts were constantly necessary in order for the learner to maintain the correct position.

2) Correct responses in the position category were reinforced by general verbal feedback paired with specific skill cues, over trials.

Execution

1) Correct skill performance, over the 6 episodes of instruction, was very sporadic. Vast differences are exhibited in the quality of performance, over episodes. (Figure 5). The quality of performance (based upon percentage correct responses) diminished from 100% (Day 2) to 0% (Day 4) and was gradually ascending on the final days of data collection. (Figure 5).

2) Over episodes, the instructor intervention was geared toward the same task step in the instructional sequence. No independent trails were attempted by the learner.

3) The level of physical assistance, in the form of complete manipulation was increased over successive episodes, while the extent of physical prompting was reduced. (Table VIII). The gradual increase in physical assistance provided the learner did not induce a corresponding increase in skill proficiency. (Figure 5). Poor skill performance may have been related to the subject's inability to maintain the pre-response position.

4) With the exception of one episode, no visual prompts or demonstrations were exhibited for the learner. (Table VII).

5) Very few specific skill mands were verbalized in the pre-response phase. The majority of verbal prompts were, by definition, skill cues.

Feedback

1) Teacher B provided Subject 4 with frequent specific and general post-response feedback. The specific feedback recorded was verbal knowledge of performance and results paired with physical prompting and the occasional demonstration over episodes.

2) In order to increase the quantity of performance responses, Teacher B on each trial, over episodes, administered many variations of general verbal and physical feedback.

General Discussion

The pre-response teacher behaviors exhibited by Instructor B, depicted in Table VIII, indicate that the thrust of teacher intervention was in the category of physical

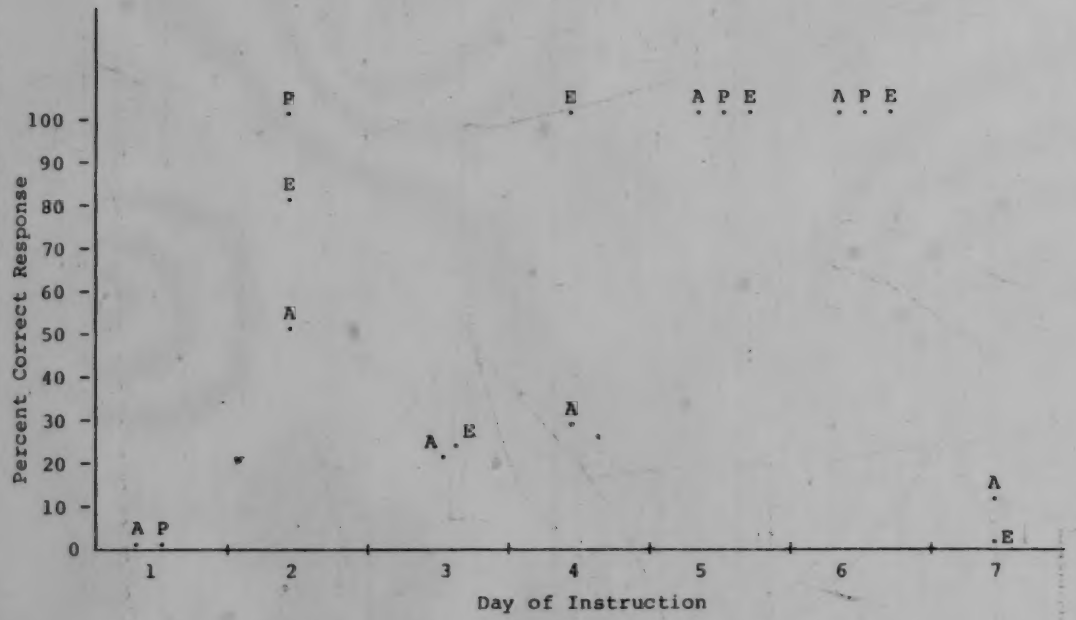
manipulation. Contrary to instructional procedures prescribed in the PREP materials, pre-response physical assistance was increased over episodes and the degree of skill proficiency decreased. The teacher provided no skill demonstration where it may have contributed to higher quality performance over episodes. The feedback provided following each response, was varied well with information being presented verbally, physically and visually. As was the case with the previous subject, Teacher B did not foster greater learner independence by reducing assistance and progressing through the task sequence, over episodes.

TABLE X

Teacher C - Subject 5

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR DISCRETE SKILL - FORWARD ROLL

Day of Instruction	Number of Trials	CM	Percent Frequency of Teacher Behaviors								
			MP	MG	D^T	D^S	PD	G	SC	AM	AC
1	6	16.6	50.0		16.6			16.6		16.6	50.0
2	12		33.3		8.3	33.3		16.6	16.6	8.3	75.0
3	19	10.5			36.8	31.5	5.2	47.3	10.5		84.2
4	19		19.0		26.3	47.3		15.7	31.5		52.6
5	17	5.8	29.4	17.6	52.9			35.2	29.4		17.6
6	10	20.0	30.0		50.0			60.0	10.0		20.0
7	11	9.0			36.3	45.4		27.2			



Day:								
1	A =	0.0 %	P =	0.0%				
2	A =	50.0	P =	100.0	E =	80.0%		
3	A =	20.0	E =	25.0				
4	A =	29.4	E =	100.0				
5	A =	100.0	P =	100.0	E =	100.0		
6	A =	100.0	P =	100.0	E =	100.0		
7	A =	10.0	E =	0.0				

FIGURE 6

Teacher C - Subject 5

PERCENTAGE CORRECT LEARNER RESPONSE PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR DISCRETE SKILL - FORWARD ROLL

TABLE XI

Teacher C - Subject 5

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	6		100.0	83.3
2	12	6.2	93.7	16.6
3	19		100.0	78.9
4	19		100.0	84.2
5	17	13.1	86.6	17.6
6	10	14.8	85.1	10.0
7	11	10.0	90.0	45.4

Teacher C - Subject 5

Points for Consideration:

Attention

1) The instructor demonstrated many and varied behaviors in order to achieve and maintain learner attention. (Table X).

2) Generally, there was a high frequency of occurrence of demonstration ($D^{(T)}$ and $D^{(S)}$) within each episode. Over successive episodes, fading of visual prompts was not evident.

3) There was a low degree of pre-response physical manipulation extended in order to achieve learner attention. (Table X).

Position

1) On occasions where attending behavior was evident, the learner quite readily assumed the correct pre-response position. Very little physical assistance was required. Teacher and student demonstrations were strategically performed in order to provide visual prompts for the learner. (Table X).

2) Correct responses for the desired behavior of position were reinforced by general verbal praise.

3) A high percentage of correct responses for position, similarly reflected correct response in skill execution. (Days 2, 5 and 6 represented in Figure 6).

Execution

1) Over episodes, the level of physical prompting was skillfully faded without adversely affecting performance. (Table X, Figure 6).

2) Typically, there was a high percentage of correct learner responses for skill execution. On the third day of instruction a low percentage was recorded (25%) which may have been associated with the 20% correct response rate for attention. On the seventh day, Teacher C reduced both physical and visual prompts drastically. (Table X). This may have had a corresponding negative effect on skill execution, as depicted in the rapid decline in scored correct responses for attention and task execution. (Table X, Figure 6).

3) The instructor exhibited very low frequency in usage of skill mands. Basically, action cues, paired with other stimuli, were sufficient prompts to bring about a learner response.

Feedback

1) Extensive usage of general feedback, in the form of verbal praise and reinforcement, was demonstrated. (Table XI).

2) The high frequency of instances where no feedback was provided, as depicted in Table XI, is a reflection of a specific instructional strategy. (Further discussed in following section).

3) The highest incidences of specific feedback were recorded on the fifth, sixth and seventh day of instruction. This may account for the high percentage of correct responses on skill execution on those days.

General Discussion

Teacher C adopted a rather informal strategy. Her intent was to make skill instruction on forward roll as

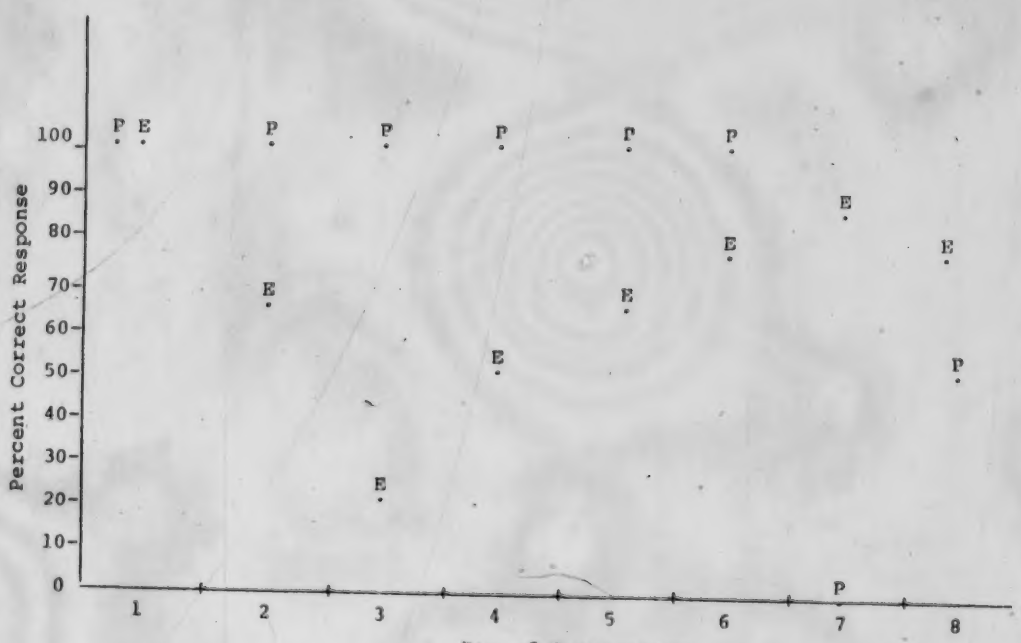
attractive and game-like as possible. Consequently many other children and staff members were engaged as skill demonstrators, designed to entice the subject into participation. This game strategy, as a means of intervention, is much in keeping with the stated philosophy of PREP - meaningful bits of information interjected into each child's free play to increase the quality and quantity of purposeful play behaviors. The instructor was not forceful in bringing about the teaching-learning situation - very little physical manipulation was applied. A teacher structured environment, charged with many verbal and visual prompts, elicited a spontaneous desire for involvement within the learner. Where learner attention was recruited, the learner engaged in the task and opportunity presented itself for skill instruction.

TABLE XII

Teacher C - Subject 6

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR CONTINUOUS SKILL - TO PEDAL A TRICYCLE

Day of Instruction	Number of Trials	Percent Frequency of Teacher Behaviors									
		CM	MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	6	16.6	50.0	33.3				16.6	16.6		66.6
2	6		66.6	16.6				16.6	16.6		83.3
3	7	28.5	57.1	14.2				28.5	42.8		28.5
4	6	66.6	33.3					16.6	66.6		16.6
5	9	44.4	55.5					22.2	66.6		11.1
6	7	42.8	57.1					14.2	71.4		
7	8	50.0	50.0						50.0		37.5
8	14	21.4	64.2	7.1					64.2		21.4



Day:			
1	P = 100.0 %	E = 100.0%
2	P = 100.0	E = 66.6
3	P = 100.0	E = 20.0
4	P = 100.0	E = 50.0
5	P = 100.0	E = 66.6
6	P = 100.0	E = 75.0
7	P = 0.0	E = 83.3
8	P = 50.0	E = 75.0

FIGURE 7
Teacher C - Subject 6

PERCENT CORRECT LEARNER RESPONSE PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR CONTINUOUS SKILL TO PEDAL A TRICYCLE

TABLE XIII

Teacher C - Subject 6

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Day of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	6	41.6	58.3	
2	6	50.0	50.0	
3	7	62.8	37.1	
4	6	59.4	40.5	
5	9	50.8	49.1	
6	7	45.0	55.0	
7	8	56.7	43.2	
8	14	59.8	40.1	

Teacher C - Subject 6

Points for Consideration:

Attention

1) Teacher C achieved learner attention merely by directing an unoccupied tricycle into the visual path of the learner. There were no recorded instances wherein the instructor deemed it necessary to prompt for an attentional response. (Figure 7).

Position

1) Due to the continuous nature of the task, once the tricycle was mounted and feet and hands were suitably placed, the correct position was established. As graphically depicted in Figure 7, Subject 6 experienced very little difficulty in preparing himself for skill execution over episodes 1 through 6. On a few occasions the teacher completely manipulated the learner's feet but as a rule manipulative prompts, paired with skill cues, were sufficient to bring about correct learner responses.

2) Subject 6 was reinforced with verbal praise and general physical contact (head rub) each time correct position was assumed. Specific skill cues related to procedures of mounting and foot placement - were administered physically and verbally as a source of information feedback.

Execution

1) Teacher C attempted to systematically reduce the degree of direct physical assistance provided the learner over episodes. The removal of the greatest degree of physical assistance, CM, produced a negative effect on skill performance, i.e. Day 1 - 100% correct response was diminished to 20% performance response on Day 3. (Table XII, Figure 7). As complete manipulation was

reinstated in the fourth episode - a corresponding increase in the quality of performance was evident. (Figure 7). In successive episodes complete manipulation was effectively reduced, empahsis was placed on physical prompting, and skill proficiency increased. (Table XII, Figure 7).

2) No truly independent trials were attempted by the learner.

3) Gestures were the only source of pre-response visual prompts and they were not reduced systematically.

4) Verbal prompts, as skill cues or action cues, were highly utilized in both pre and post-response phases. Teacher C emitted continuous commentary throughout all instructional phases. No specific skill mands were recorded. (Table XII).

Feedback

1) Generally, the information feedback provided the learner was in the form of specific verbal skill cues and action cues. These sources of input were frequently accompanied by physical prompts related to body position. (Table XIII).

2) As previously stated, Teacher C consistantly provided verbal commentary throughout the duration of the instructional episode. Consequently, there were no trials recorded wherein feedback was not provided. (Table XIII).

3) Teacher C established a balance between the types of feedback delivered in the post-response phase. Through increased application of specific feedback, the quality of the performance was maintained or heightened. Also, diversity was exhibited in usage of positive general feedback - thus creating pleasant learning conditions and and increased frequency of responses.

General Discussion

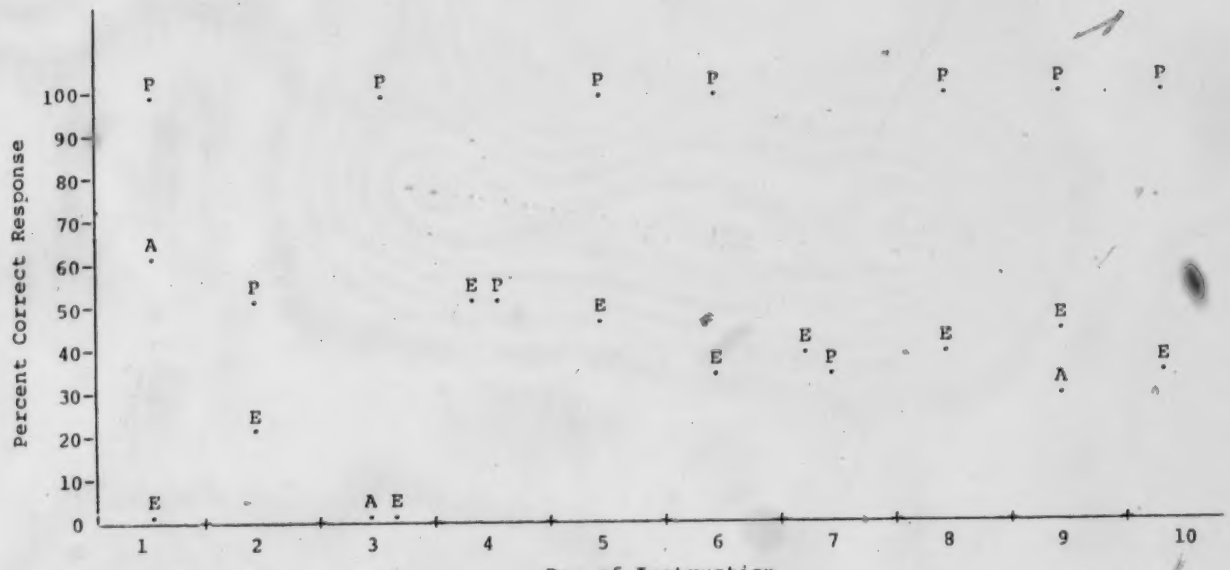
Teacher C directed the skill learning of this subject in a very systematic manner. Over episodes, the level of physical assistance was effectively reduced as the skill proficiency of the learner increased. The level of instruction within the task sequence, progressed from task step 1 to task 3 over episodes. The teacher structured the environment in order to limit distractions and maintain high levels of attending behavior. Ample feedback was provided, always positive in nature,which had a subsequent positive effect on learner performance. Each episode concluded with a correct learner response which was vastly reinforced so as to sustain learner interest for subsequent instructional episodes.

TABLE XIV

Teacher D - Subject 7

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR DISCRETE SKILL - TO STRIKE A BALL

Day of Instruction	Number of Trials	Percent Frequency of Teacher Behaviors									
		CM	MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	7				42.0			57.1			57.1
2	7	14.2					28.5	14.2	42.8	57.1	
3	7			14.2	14.2					40.0	60.0
4	12	50.0	33.3	16.6				50.0	83.3		16.6
5	14	21.4	14.2	21.4				35.7	42.8		35.7
6	20	50.0	5.0	5.0				30.0	50.0		40.0
7	21	66.6	19.0				4.0	42.8	61.9	9.5	19.0
8	18	66.6	16.6					27.7	50.0	16.6	27.7
9	22	31.9	4.5	4.5	4.5	27.5		22.7	13.6	9.0	36.3
10	8	62.5							50.0	12.5	



Day:						
1	A =	60.0%	E =	0.0%	P =	100.0%
2	P =	50.0	E =	20.0		
3	A =	0.0	P =	100.0	E =	0.0
4	E =	50.0	P =	50.0		
5	P =	100.0	E =	45.4		
6	P =	100.0	E =	33.3		
7	P =	33.3	E =	38.8		
8	P =	100.0	E =	37.5		
9	A =	28.5	P =	100.0	E =	42.8
10	P =	100.0	E =	33.3		

FIGURE 8

Teacher D - Subject 7

PERCENT CORRECT LEARNER RESPONSES PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR DISCRETE SKILL TO STRIKE A BALL

TABLE XV

Teacher D - Subject 7

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Days of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	7		100.0	57.1
2	7	60.0	40.0	42.0
3	7		100.0	
4	12	35.0	65.0	
5	14	19.1	80.9	
6	20	26.0	73.0	20.0
7	21	38.0	62.0	4.0
8	18	22.2	77.7	
9	22	25.7	74.2	
10	8	61.5	38.4	

Teacher D - Subject 7

Points for Consideration:

Attention

1) In 7 of 10 instructional episodes, Teacher D did not employ specific strategies to attain learner attention. On the occasions where efforts were made to have the learner attend, responses were poor - the maximum correct percentage being 60%. (Figure 8).

Position

1) The learner quite readily assumed the correct pre-response position with the exception of Days 2, 4 and 7. In these instances, the degree of complete manipulation had been notably increased - which seemed to have an adverse effect upon the learner.

2) Correct responses for the desired behavior of position were reinforced by general verbal praise paired with general physical contact (head rub or patting).

Execution

1) Over episodes, instructor assistance in the form of physical, visual and verbal prompts was not reduced in a methodical fashion. Procedures of complete manipulation were introduced sporadically and did not generate a significant increase in the quality of the performance. (Table XIV, Figure 8).

2) Teacher D designated several trials per episode as opportunities for the learner to rehearse the skill independently. This may account for the low percentage of correct learner response recorded over the entire period of instruction. (Figure 8).

3) Visual prompting strategies were evident within the pre and post-response instructional phases. Extensive practices of demonstration and gesturing were evident. (Table XIV).

4) Skill cues accompanied by varied cues for action were emitted by the instructor to occasion a learner response.

Feedback

1) The data presented in Table XV indicates extensive use of general forms of information feedback. Typically, the nature of this feedback was verbal praise and physical contact (hug or pat).

2) The teacher initiated specific feedback was diverse. The post-response input was comprised of verbal skill cues, visual teacher demonstration and physical prompting and manipulation.

3) Heightened instances of provision of specific feedback did not appear to have a signifcant effect upon the quality of subsequent responses. (Figure 8).

4) Episodes 1 and 2 (Table XV) observances were recorded where learner responses were not followed by feedback of any type. This may have contributed partially to the recorded low percentage of correct responses on skill performance for those days.

General Discussion

The pre-response teacher initiated behaviors, depicted in Table XIV, demonstrate great efforts on the part of Teacher D to provide sources of input from all response prompting categories. Although physical manipulation was not effectively reduced over episodes, attempts at fading manipulative prompts were evident. Independent trials

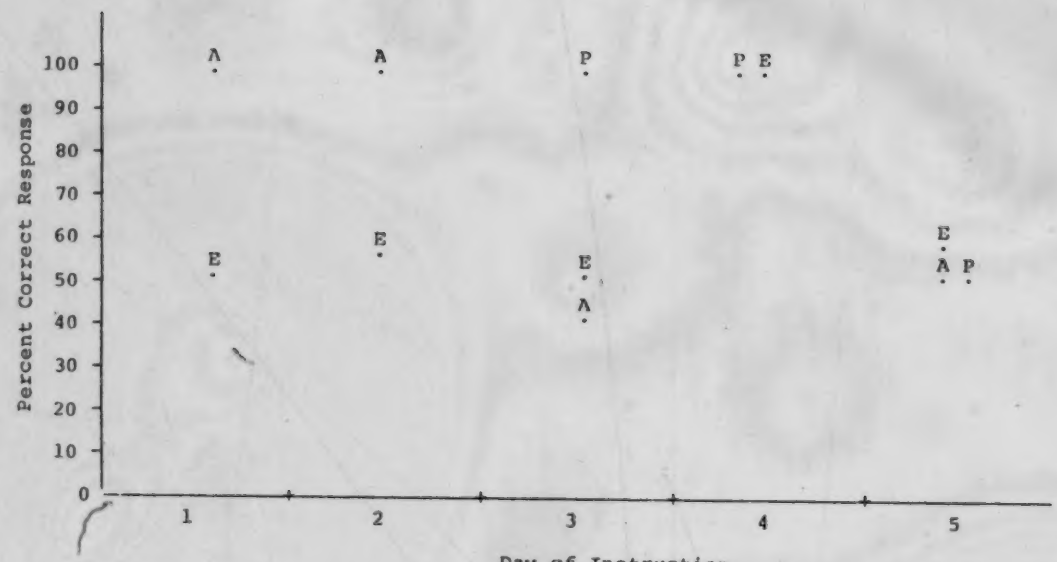
were incorporated into each instructional episode which may account for the consistantly low standard of performance. The student who served as the subject in this case, was a particularly independent child who did not respond well to physical manipulation. Teacher D was quite perceptive and did not employ procedures necessitating physical contact without first informing the learner. No marked increase in skill proficiency was apparent at the conclusion of the ten day instructional period as the instructional base remained on the same task step throughout. Teacher D demonstrated a very gentle yet purposeful manner of instructional intervention and did strive to create a stimulating learning environment.

TABLE XVI

Teacher D - Subject 8

PERCENT FREQUENCY OF TEACHER BEHAVIORS IN PRE-RESPONSE PHASE FOR DISCRETE SKILL - SEAT DROP ON A TRAMPOLINE

Day of Instruction	Number of Trials	Percent Frequency of Teacher Behaviors									
		CM	MP	MG	D^T	D^S	PD	G	SC	SM	AC
1	13	38.4	7.6		38.4				7.6	76.9	15.3
2	10	50.0	10.0		60.0	10.0		20.0	10.0	60.0	20.0
3	16	50.0	6.2	6.2	50.0			6.2	18.7	31.2	12.5
4	10	80.0	10.0		80.0				10.0	80.0	
5	21	47.6	9.5		42.8			14.2	4.7	66.6	9.5



Day:			
1	A = 100.0%	E = 50.0%	
2	A = 100.0	E = 55.5	
3	A = 40.0	P = 100.0	E = 50.0%
4	P = 100.0	E = 100.0	
5	A = 50.0	P = 50.0	E = 58.8

FIGURE 9

Teacher D - Subject 8

PERCENT CORRECT LEARNER RESPONSES PLOTTED FOR ATTENTION, POSITION AND EXECUTION FOR DISCRETE MOTOR SKILL - SEAT DROP ON A TRAMPOLINE

TABLE XVII

Teacher D - Subject 8

PERCENT SPECIFIC AND PERCENT GENERAL FEEDBACK AND PERCENT OCCURRENCE NO FEEDBACK PROVIDED

Days of Instruction	Number of Trials	Percent Specific Feedback	Percent General Feedback	Percent Occurrence No Feedback Provided
1	13	55.8	44.1	7.6
2	10	75.0	25.0	
3	16	57.7	42.3	18.7
4	10	69.0	40.9	
5	21	67.3	32.7	

Teacher D - Subject 8

Points for Consideration:

Attention

1) As depicted in Figure 9, the learner demonstrated inconsistencies in attending behaviors. In the third instructional episode, the percentage of correct responses for attending diminished to 40% from a recorded 100% on the previous day. This may be in association with a recognized reduction in the provision of skill mands on the same occasion.

2) Correct attending behaviors were reinforced by verbal praise accompanied by general physical contact which expresses approval.

Position

1) Teacher D did not prompt for the pre-response position on every occasion. The desired position, prior to the execution of the seat drop, was achieved through manipulative prompting paired with skill cues.

2) On each occasion where correct position was maintained the learner received specific feedback information related to pre-response components.

Execution

1) Typically, during the actual movement of dropping to the seat and returning to a standing bounce, the learner required complete physical manipulation - across episodes. Instruction, over the five day period, was consistently regulated to meet the task requirements of step 2 in the instructional sequence - to seat drop on a trampoline.

2) Teacher D provided the learner with opportunities to complete the task independently. This was evident on Days 3 and 5 in particular, where many

trials were conducted within the episode.

3) The specific pattern of response prompting was demonstrated. When assistance was provided, it was not significantly reduced within trials over instructional episodes. On the fourth day, complete manipulation was increased to 80% (Table XVI) and in congruence the quality of learner performance was elevated from 50% to 100%.

4) Visual prompts in the form of teacher demonstration and gestures contributed pre-response information on each occasion of instruction. (Table XVI). Each instance of teacher demonstration was accompanied by an ongoing commentary comprised of the specific skill cues of execution.

5) Verbal prompts were emitted in high frequency in all instructional phases. Prior to response, skill mands were delivered with greatest intensity. (Table XVI)

Feedback

1) The post-response instructional phase was highly informative for the learner. Specific feedback, as knowledge of performance, was presented through physical, visual and verbal means. High incidence of teacher demonstration paired with manipulative prompts was recorded.

2) Increased frequency in the delivery of specific feedback did not appear to induce a reciprocal increase in the quality of the performance. (Table XVII, Figure 9).

3) General feedback, typically in the form of verbal praise was evident within trials of each instructional episode. (Table XVII).

4) There were very few recorded instances of completed tasks which did not receive feedback of some description. (Table XVII).

General Discussion

The duration of this instructional period, five days, was considerably shorter than that recorded for subjects previously discussed. This was due to the absence of one of the original subjects. Data for Subject 8 was collected over the last five days of instruction.

Teacher D attempted to reduce physical assistance within episodes by directing the learner to perform the skill independently. The criterion of the second step within the task sequence necessitated extensive use of physical prompting and manipulation to facilitate the re-establishment of the correct position. (Following a drop to seated position). This instructor was actively engaged throughout the entirety of each instructional episode. Teacher D generated high levels of responding through elaborate usage of prompting techniques throughout all instructional phases. Generally, the intervention was a positive one and high levels of learner interest were maintained.

Congruence Between Observed Practices and Recommended Prep Program Instructional Procedures.

The instruments of observation and analysis implemented in this study were effective in providing a composite description of each instructional intervention. The value of such a model in terms of information feedback for teachers may rarely be disputed. However, it should be noted that the relevancy of this instrument within other instructional environments has not been established. In fact, the conclusions stated have been based solely upon information from the limited data collection period which refers only to the pre-selected skills of instruction investigated. The researcher was not actually certain of each teacher's intention during skill instruction. Uncontrollable factors, such as a change in the learner's emotional state, may have necessitated an alteration in instructional procedures.

An analysis of the observed teacher practices in contrast with the strategies of intervention recommended in the Prep Program materials isolated the following points for consideration:

1) Generally, the pre-response teacher behaviors evident in the data indicated that across teachers there was no systematic reduction in the degree of teacher assistance. Prep instructional strategies, for each task sequence, indicated that instructor prompting be systematically

reduced, over episodes, on a continuum from complete manipulation, through various stages of partial prompting, to demonstration, then to verbal cues. Only in one case, of eight data sets, did an instructor direct the skill learning in an attempt to decrease the assistance provided and subsequently increase learner independence.

2) Delaying the prompt refers to an instructional technique whereby a verbal cue is delivered and the instructor awaits a learner initiated response, before further assistance is administered. According to Prep Strategies, an intermediate step may be used, wherein the instructor gives the verbal cue, waits for the response to be initiated and further prompts the child if no response is given. Observations of the videorecordings did not generally show overt behaviors of delaying the prompt as being evident. There were only three occurrences of pauses recorded within the transcribed data.

3) In seven of the eight teacher-learner situations, instruction was conducted on the same task step over successive episodes (Appendix D). Since the level of learner responding, within the task sequence, was indicative of skill proficiency, one would infer that the quality of the learner's skill performance was only minimally improved over the ten days of instruction. Two factors which may have contributed to the relatively small increases in skill are: 1) not prompting for and maintaining learner attention and 2) not ensuring that the learner assumed the correct pre-response position (Figures 3,7,8). Teacher subjects investigated

demonstrated inconsistencies in their instructional strategies, thus making it difficult to generalize. Within and across instructional episodes, the techniques employed varied considerably, some days pre-skill conditions (attention and/or position) were desired and on other occasions instruction commenced with skill execution as the desired response.

4) Prep strategies advocate the usage of reinforcers for shaping behaviors, in order to increase the frequency of responding. Instructional materials indicate that reinforcers should be delivered immediately following the desired response and recommend that the nature and intensity of reinforcers be varied. This study investigated post-response teacher behaviors and categorized each in terms of their nature: general or specific as well as by the means of delivery: visually, physically or verbally. Wall, Watkinson and Shatz (1979) recommended that Prep instructors emphasize specific feedback information during the initial learning stages but that a mixture of general and specific feedback information may contribute to more successful instruction over extended periods of time. The instructors of this study differed in their post-response behaviors. Teacher A delivered feedback which was more general than specific with subjects 1 and 2 (Tables 111 and V). However,Teacher B provided a higher percentage of specific feedback with both subjects 3 and 4

(Tables Vll and lX). Teachers C and D split with each of their subjects, one subject of each teacher received more specific than general feedback. There does not appear to be any congruence between the percentage specificity of feedback information and the step of skill instruction for each subject (Table XVlll - Appendix D).

5) It was apparent upon observation, that the interrelations between the teachers and learners were very positive. The instructors provided opportunity for many trials within instructional episodes. Extensive delivery of praise and reinforcement were conducive to extended instruction and appeared to provide for pleasurable learning experiences.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

The major focus of this research was to identify the contingencies which existed between teacher behaviors and learner responses within episodes of individualized instruction on gross motor skills. This issue was dealt with in two phases. Firstly, the data which was collected was transcribed from videotape recordings, into visual information through the implementation of an observational instrument designed to classify all behaviors which naturally occurred during instruction. Within the second phase of the study, an extensive analysis of the descriptive data was conducted. The material for each subject was critiqued according to the objective indices of the quality of instruction. Each data set was then evaluated and discussed in two dimensions: on an individual basis, as well as collectively from a programmatic perspective. The long range intention was to establish this procedure as a valuable source of teacher feedback and concurrently provide instructors with a catalyst for increased teacher effectiveness.

The subjects of this study were eight male moderately mentally retarded children and their four female instructors, all of whom participated in the PREP Program within the University of Alberta. Each teacher selected two children, from those in her care, for individualized instruction. Data was collected, by means of videotape recordings, over ten days of program operation. Following the completion of data collection, each instructional episode was observed and behaviors were coded according to definitions provided by the descriptive instrument. One other person was trained in recording procedures and 16.1% of the data was scored as a measure of inter-observer agreement.

The data was then treated relevant to the established indices of the quality of instruction. Calculations were formulated to depict the occurrence or non-occurrence of significant behaviors within and across instructional episodes. The results, presented and discussed for each individual teacher and learner, were summarized in the fifth chapter. The instructional indices were also utilized to denote the congruence between observed teacher practices and the strategies recommended in PREP Program materials.

Conclusions

The observational instrument implemented in this study was effective in providing a composite description of instructional intervention, depicting teacher behaviors and learner responses throughout all instructional phases.

The complexity of the instrument was recognized upon consideration of the extensive time periods required to accurately transcribe information from videotapes to the recording forms. However, with time, the descriptive instrument accurately and objectively isolated behaviors deemed crucial to instruction, which was verified by the 86.06% measure of inter-observer agreement.

The contingencies which existed between teacher behaviors and learner responses were quite readily identified through the application of instructional indices.

An analysis of the instructional strategies indicated, with consistency, that the following practices were generally apparent within instructional episodes:

> The degree of instructor assistance was not systematically reduced within successive trials or across instructional episodes. The observed levels of pre-response prompting, as physical, visual or verbal information were not diminished in accordance with the procedures recommended by the PREP response prompting continuum.

> For discrete motor skills no marked decrease in the proximity of the instructor was visible. Generally, prompts and cues emitted over episodes were geared toward the same step in the task sequence. Only in three of eight data sets did the subject independently rehearse the task.
>
> It was very difficult to detect reductions in physical assistance and instructor proximity when instruction was on continuous skills. Similarily, difficulty was also experienced in observing an increase in skill proficiency on continuous tasks. An example of this may be apparent on the task - to swing on a rope, where in Step 2 in the sequence refers to the action being performed - "while being swung with teacher's support" and Step 3 refers to the learner "swinging without support after an initial push". (Watkinson, 1976).

The critical indices, when applied, provided an accurate and thorough assessment of all interactions and behaviors characteristic of each instructional episode. It may be concluded that the application of the aforementioned procedures should provide instructors with valuable feedback information pertinent to the quality of their instruction.

Implications for Further Research

The information emanating from this research confirms the assumption that the instruments employed to describe and analyze instructional intervention did in fact isolate the critical factors of instruction. Further implimentation of these procedures is recommended as an effective means of teacher training.

It may be valuable to investigate the various means of modifying or changing specific teacher behaviors in a short period of time, in order to increase the quality of teacher performance. Change in teacher behaviors may be analyzed according to treatment conditions which employ videotape procedures for modeling and feedback. Video recordings have the distinct advantage of providing a comprehensive record of behaviors which may be viewed repeatedly. Unfortunately, the procedure is very time consuming and as a consequence teachers have a tendancy to disregard video procedures as a source of feedback. It is possible that purely descriptive information on intervention strategies could be provided merely by coding from live observations. Perhaps slight modifications of the instrument would be necessary to facilitate speed in recording. It may be of value to determine the amount of information which would be lost due to the modifications, prior to the implementation of such procedures.

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APPENDIX A

TRAINING PACKET

An instrument to describe individualized instruction for continuous and discrete gross motor skills within the PREP Pre-school Program.

Instructional Indices and Coding Symbols

Phase of Instruction		Symbol
A)	**Pre-instruction**	
	Desired Response	
	I Attention	A
	II Position	P
	III Execution	E
B)	**Pre-response**	
	Physical	
	I Complete Manipulation	CM
	II Manipulative Prompt	MP
	III Minimal Guidance	MG
	Visual	
	I Teacher Demonstration	$D^{(T)}$
	II Student Demonstration	$D^{(S)}$
	III Partial Skill Demonstration	PD
	IV Gestural Prompting	G
	Verbal	
	I Skill Cue	SC
	II Skill Mand	SM
	III Action Cue	AC
C)	**Response**	
	Correct Response	C
	Incomplete Response	I
	Incorrect Response	X
	Negativism	N
D)	**Post-Response**	
	Physical	
	I Complete Manipulation	CM

D) Post-Response (continued)

II	Manipulative Prompt	MP
III	Minimal Guidance	MG
IV	General Feedback	GF

Visual

I	Teacher Demonstration	$D^{(T)}$
II	Student Demonstration	$D^{(S)}$
III	Partial Skill Demonstration	PD
IV	Gesture	G

Verbal Response

I	Skill Cue	SC
II	Skill Mand	SM
III	Action Cue	AC
IV	General Feedback	GF

Interruption	/
Pause	*

Definition of Terms

Attentional Prompt

Any verbal, visual, plysical or auditive behaviour emitted by the teacher to gain learner attention and/or eliminate distractions.

Position

The performance of a motor response which brings the learner to a prepared state - prior to the execution of a specific skill.

Execution

Any attempt by the learner to perform a motor response in congruence with the specific skill task.

Complete Manipulation

Complete manipulation refers to the greatest amount of physical assistance provided to the learner. The teacher physically moves the learner's body or body part through the desired motor response.

Manipulative Prompt

Manipulative prompt refers to the momentary physical support provided by the teacher at some point during the learner response.

Minimal Guidance

Minimal guidance refers to a contacting or guiding of the learner's body which gives direction or signals the body part to be moved.

Teacher Demonstration

Teacher demonstration refers to a physical performance of the complete skill, by the teacher which serves to occasion a desired imitative response by the learner.

Student Demonstration

Student demonstration refers to a physical performance of the complete skill, by another child, which serves to occasion a desired imitative response by the learner.

Partial Skill Demonstration

A partial skill demonstration refers to the physical performance of a component of the skill which serves to occasion a desired imitative response by the learner.

Gestural Prompt

A gestural prompt refers to a teacher initiated movement which does not represent part of the skill but which serves to indicate the expected movement.

Skill Cue

A skill cue serves to focus the learner's attention on the key features of the movements required to complete the skill. It may be an action word that describes a component of the skill.

Skill Mand

A skill mand provides a verbal description of the desired skill. It may be a specific action word used in command or question form.

Action Cue

An action cue is a word or group of words which motivates the learner to perform a specific skill. An action cue is not a description of the skill itself.

Correct Response

A correct response may be defined as a behavioral response by the learner which fulfills some, but not all, task requirements.

Incorrect Response

An incorrect response may be defined as any attempt made by the learner to fulfill task requirements which is totally unsuccessful.

Negativism

Negativism refers to any physical behavior, on the part of the learner, which is contrary or unrelated to the task set by the teacher and clearly shows non-cooperation.

General Feedback

General feedback refers to any teacher initiated information provided about the behavioral response which expresses a simple evaluation. The feedback may be physical, visual or verbal but it does not provide any specific information relative to the performance of or the outcome of the response.

Interruption

An interruption refers to any unnatural break in the continuity of the individualized instructional period.

Pause

Any delay, of five seconds duration or longer, before the provision of additional teacher prompting assistance is known as a pause.

Self Testing Exercises

Exercise I

Name the behavior or instructional technique represented by each of the following code symbols

1. N _____
2. CM _____
3. / _____
4. A _____
5. X _____
6. G _____
7. $D^{(S)}$ _____
8. I _____
9. E _____
10. AC _____
11. PD _____
12. C _____
13. GF _____
14. MP _____
15. $D^{(T)}$ _____
16. SM _____
17. SC _____
18. MG _____

* Refer to list of Instructional Indices for the answers.

Exercise II

Please indicate the appropriate code symbol for the following words, sentences or phrases describing an interaction.

1. "Bend your knees" _____
2. "Look this way" (teacher turns learner's face toward her) _____
3. Teacher holds trike as learner climbs on _____
4. "Good girl" _____
5. "1 - 2 - 3 - GO" _____
6. Teacher taps knee of learner before learner jumps down _____
7. Teacher says, "John, show Ed your forward roll." _____
8. "Jump Susan" (Susan runs away) _____
9. "Good peddling, keep on pushing down" _____
10. "Climb on" teacher places child's foot on pedal _____
11. "Kyle, Kyle look where you are going" _____
12. "Hit it hard!" _____
13. Teacher says, "No - do it like this" _____
14. "Oh - you forgot to tuck your head under" _____
15. "Good" _____
16. "Put your hands out" (Child puts hands out) _____

Exercise II (Continued)

17. Teacher hugs learner after successful catch _____

18. "Hold onto the bar" (Teacher points to the bar) _____

19. "Jump with me" Teacher jumps beside learner _____

20. "Show me, show me" _____

Answers:

1. SC	2. A - MP	3. MG	4. $GF^{(\dot{V})}$
5. AC	6. MP	7. $D^{(S)}$	9. N
9. $GF^{(V)}$ - SC	10. P - CM	11. A - AC	12. SM
13. $GF^{(V)}$ - $D^{(T)}$	14. SC	15. $GF^{(V)}$	16. C
17. GF (P)	18. P - G	19. SM - $D^{(T)}$	20. E - AC

Exercise III

Please code the following situations and interactions.

A) Skill - To ascend stairs alternating feet

"Susan, can you climb up the stairs?"[1.] _____ (Susan turns head and walks away)[2.] _____ "Susan!" (Teacher touches child's chin)[3.] _____ "Ready - step up"[4.] _____ Susan steps up with one foot and brings other foot to same step.[5.] _____ "Good, Susan, can you use that foot next time" (Teacher points to child's opposite foot)[6.] _____ "O. K., 1 - 2 - 3 - Go"[7.] _____ Susan steps up four stairs alternating feet.[8.] _____ "Good climbing Susan - you used both feet!"[9.] _____

B) Skill - To swing on the rope

"Come on Tim, climb up here." (Teacher taps the bench)[1.] _____ Tim climbs onto bench.[2.] _____ "Put the rope between your legs - and hold on tight."[3.] _____ Teacher places rope between Tim's legs.[4.] _____ "O.K. Good."[5.] _____ "1 - 2 - 3 - Swing"[6.] _____ (Teacher holds Tim on rope and swings back and forth)[7.] _____ "Good swinging - Hold on up higher."[8.] _____ (Teacher taps rope above Tim's hands.)[9.] _____ "Good holding on."[10.] _____ (Hugs)[11.] _____

Exercise III (Continued)

Answers

A) Skill - To ascend stairs alternating feet

1)	SM	2)	N	3)	A - MP
4)	SM	5)	I	6)	GF - SC - G
7)	AC	8)	C	9)	GF^{+V} - SC

B) Skill - To swing on the rope

1)	P - G	2)	C	3)	P - SC
4)	CM	5)	GF + V	6)	SM
7)	CM	8)	GF + V - SC	9)	G
10)	SC	11)	GF + P		

Rules for Coding

1. Any behavior which does not fit into a category, as defined by the definitions, is to be ignored.

2. All meaningful pieces of information are to be recorded providing:
   a) that they can be categorized
   b) that they are not excluded by the coding rules.

3. Code symbols are to be recorded sequentially in horizontal fashion specifying the course of events through each instructional phase recorded for each trial.

	Preinstruction	Pre-Response	Pause	Response	Post-Response
T 1.					
T 2.					
T 3. ↓					

4. Coding Procedure

Before coding, it is advisable that the observer view the entire videotape recording of the specific teaching episode.

To begin coding, the observer must record all verbal

4. Coding Procedure (Continued)

prompts and verbal feedback emitted by the teacher during the episode. These serve as indications for the sequencing of behaviors (Recorded in columns on extreme left and extreme right of recording form.)

When each verbalization has been recorded the observer must return to the initial interaction on the tape, identify and record each prompt used by the instructor. These prompts must be noted under the "Desired Response" category indicating the expected learner response: A for attention, P for position and/or E for execution, over successive trials.

The observer must record the prompting strategy implemented by the instructor, coded, by level, in the "Pre-Response" category.

Any delay, of five seconds duration or longer, before the teacher provision of additional prompting assistance is recorded under the "Pause" category.

Following a learner response, the observer must evaluate it and record the response as Correct (C), Incorrect (X), Incomplete (I), or Negativism (N) in the appropriate space under "Response".

All teacher behaviors given as feedback must be noted, identified by: category (physical, visual or verbal), their level within the category and by their nature (specific or general) in the space allocated under "Post-Response".

APPENDIX B

Sample Completed Coding Form

Explanation of Examples from Completed Coding Form

Name of Teacher & Learner _____

Sample Coding Form

Date _____

Motor Skill _____

		PRE-RESPONSE			Pause	RESPONSE	POST RESPONSE		
VERBAL PROMPTS	DESIRED RESPONSE (A, P, E)	PHYSICAL	VISUAL	VERBAL			PHYSICAL	VISUAL	VERBAL RESPONSE
		CM MP MG	$D^{(T)}$ $D^{(S)}$ PD G	SC SM AC		C I X N	CM MP MG GP	D PD G	SC SM AC GP

Name of Teacher & Learner
Sandra and Roxanne

Completed Coding Form

Date April 6, 1980

Motor Skill Ball bouncing

		PRE-RESPONSE			Pause	RESPONSE	POST-RESPONSE		
		PHYSICAL	VISUAL	VERBAL			PHYSICAL	VISUAL	VERVAL RESPONSE
VERBAL PROMPTS	DESIRED RESPONSE (A, P, E)	CM MP MG	D(T) D(S) PD G	SC SM AC		C I X N	CM MP MG GF	D PD G	SC SM AC GF
Roxanne - come over here - over here	A				*	C			GREAT (GF)
Will you show me how you bounce the ball	E	MP	D(T)	SM		I		PD	That's right (GF) Hit it on top (SC)
O.K. - Got it? Hit it on top	E		PD	SC		C	GF		Good girl (GF)
Watch me, Roxanne, watch how I hit the ball - Are you watching	A		D(T)	AC		C			O. K. Good (GF)
Can you do that? 1 - 2 - 3 Go	E			AC		X			Oops - you missed that one - you'll have to hit it on top (SC)
Let me help - how do you hold the ball? Bend your knees	P	MP	G	AC		C		D	Good Roxanne we bend our knees this way (SC)
O.K. - Ready Bounce	E			SM	*	I			Good bouncing Hit it harder (SC)

Translation of Sample Teaching Episode

Each trial within any instructional episode is to be read, from transcribed data, in horizontal fashion, commencing in the verbal prompts category of the pre-instructional phase and concluding with post-response information provided.

There were seven trials identified within the sample instructional episode: two for the desired response of attention, one for position and the remaining four were for skill execution.

Trial 1. Instructor verbally prompted for learner attention - paused and received the correct response. The instructor reinforced the attending behavior with the general verbal response "Great".

Trial 2. Having attained learner attention the instructor verbally prompted for the execution of the skill - ball bouncing. Within the pre-response phase the teacher demonstrated the skill and used a manipulative prompt accompanied by a direct skill mand - bounce the ball. The child's response was incomplete in that the ball did not rebound in correct nature. The response was reinforced with a general verbal comment accompanied by a specific skill cue and partial skill demonstration (teacher performs tapping motion with hands).

Trial 3. On the third trial, again for skill execution, the instructor paired a skill cue (hit it on top) with a partial skill demonstration which resulted in a correct learner response. This was reinforced by two forms of general feedback verbal (good girl) and physical (head pat).

Trial 4. The desired response for the fourth trial was learner attention during which the instructor demonstrated proper skill technique. Attention was obtained followed by general verbal reinforcement.

Trial 5. The successive trial was marked by a fading of instructor assistance. An action cue, the only pre-response instructor behavior, resulted in an incorrect learner response. This was followed by specific feedback in the form of a skill cue.

Trial 6. For this trial the instructor assisted the learner into the correct position by the use of a visual prompt (gesture) and a manipulative prompt (touch of the knees). The correct response was reinforced by general verbal feedback accompanied by a demonstration.

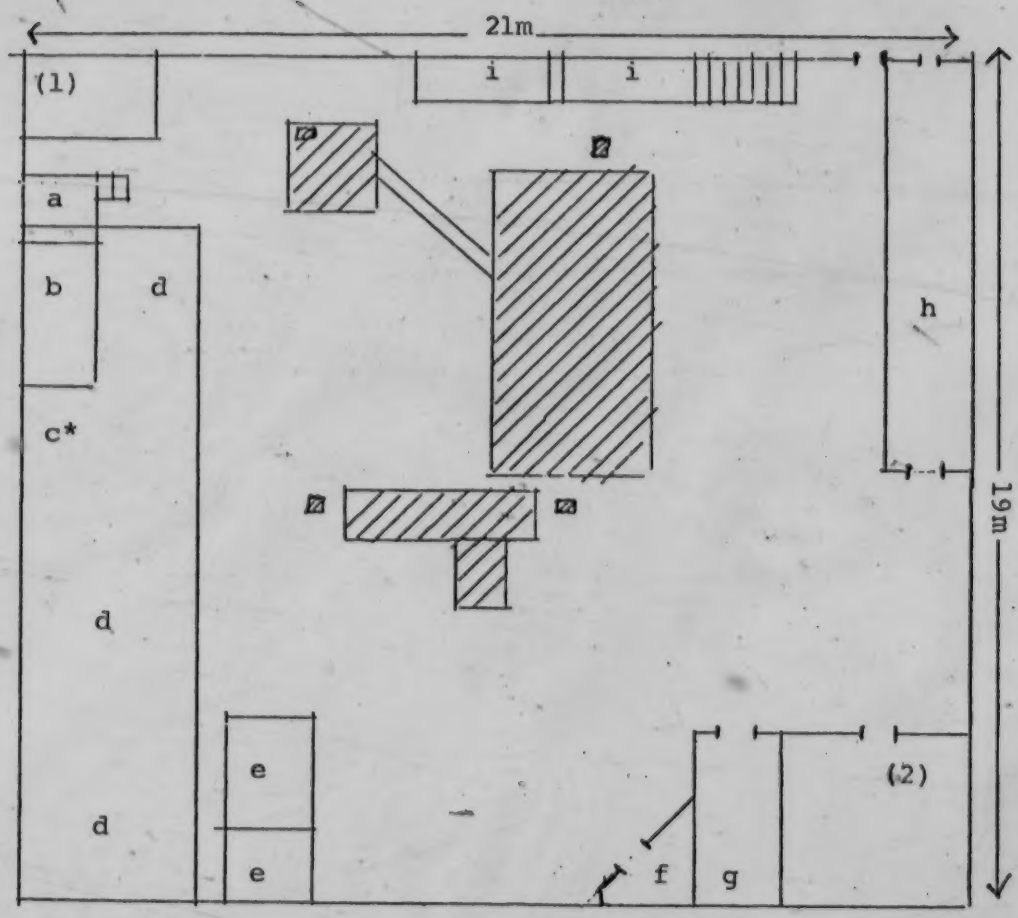
Trial 7. In the final trial of the episode, the instructor administered a specific verbal skill mand, and paused awaiting learner response. The execution of the skill did not meet all task requirements and thus was scored incomplete. The episode ended with general reinforcement of verbal nature accompanied by the skill cue: hit it harder.

APPENDIX C

Diagram of Structured Learning Environment

PREP ROOM

Diagram 1



▨ - support pillar

▨ - climbing apparatus

⊣⊢ - door

1 - platform

2 - office

a - steps and platform to trampoline

b - trampoline

c - climbing rope (*suspended from ceiling)

d - large mat (4m x 15m)

e - scotter ramp

f - play house

g - washrooms

h - observation room (one way mirror camera area)

i - large slide (2m ladder, 3m platform, 3m long slide)

APPENDIX D

Background Information on Subjects

Task Steps and Skill of Instruction

Background Information on Subjects

Subject 1

Subject 1 was a male, aged 5 years 6 months at the time of data collection. Mental retardation in this subject was resulting from down's syndrome. The physical development of this boy was somewhat delayed thus the subject's stature was tiny. He exhibited many play skills and interacted well with the other children and instructors. He was cooperative during the periods of data collection and appeared to interact positively with Teacher A. He appeared to enjoy the rope swing activity and consequently was motivated and attentive across episodes of instruction.

Subject 2

Subject 2 was a male, aged 6 years 10 months the time of data collection. Mental retardation in this case was due to brain damage at birth. This subject also demonstrated some behavioral disturbances which may have contributed to the lower than desired rate of responding. He was very easily distracted and experienced difficulty in attending. This subject thrived upon teacher attention and reinforcement both verbal and physical in nature. During episodes of data collection, this subject was neither cooperative nor easy to manage. Teacher A persisted in her attempts to stimulate the learner by providing many trials and by

delivering varied sources of input and feedback.

Subject 3

Subject 3 was a male, aged 5 years 7 months at the time of data collection. Mental retardation was due to brain damage, no physical disabilities were apparent. The interactions between Teacher B and this subject were positive. The verbal skills of this child were very limited but he was quite receptive to instruction. The subject was very mild-mannered, cooperative and anxious to please the instructor. He enjoyed the task of instruction and consequently was fairly easy to motivate.

Subject 4

Subject 4 was a male, aged 8 years 2 months during the period of data collection. Mental retardation was due to down's syndrome. The physical development of this subject was substantially delayed in comparison with non-retarded children of the same age. The subject was a very cooperative, pleasant and outgoing boy who interrelated quite well with his instructor and other children. This subject did not initiate any skills which required extended periods of activity as his physical strength and capacity to endure were limited.

Subject 5

Subject 5 was a male, aged 8 years 4 months at the time

of data collection. Mental retardation was due to down's syndrome. This subject, although non-verbal, was quite expressive through the use of gestures and facial expressions. He was a very independent boy, who initiated many of the skills taught within the Prep Program. Teacher C established a good working relationship with this subject. The instructor modified her intervention strategies to accommodate for the independence of this learner by creating a game-like environment, in which instruction was to occur. The personalities of the instructor and learner appeared to complement each other which provided for a pleasant learning environment.

Subject 6

Subject 6 was a male, aged 8 years 2 months at the time of data collection. In his case, mental retardation was in the form of down's syndrome. This subject was typically very inactive, initiated few skills and required a great deal of prompting. This boy had a very docile manner, was easily manipulated and responded well to Instructor C. He appeared to enjoy the task of trike riding while receiving assistance but did not initiate any activity independently.

Subject 7

Subject 7 was a very active little boy, aged 6 years 11 months at the time of data collection. He responded well to Instructor D, and demonstrated a great deal of interest

in the task of instruction. He was quite capable of understanding verbal prompts, both pre and post-response, and subsequently responded well to instruction. He initiated many other skills, cooperated well with other children and staff and demonstrated some fairly high level play behaviors. Upon occasion he experienced difficulty in attending to instruction and consequently may have progressed a bit slower than anticipated.

Subject 8

Subject 8 was a male, aged 6 years 2 months at the time of data collection. Mental retardation was the result of minimal brain damage at birth. He was a very timid little boy, who was highly dependent upon teacher approval and direction. Instructor D interacted in a positive manner with this child and fostered greater independence in him through a supportive yet challenging manner. This subject did not initiate many play skills although they were assessed as being in his play repetoire. The instructor demonstrated an understanding of this childs fears, developed a trusting relationship and was successful in having him complete many trials within instructional episodes.

TABLE XV111

INFORMATION ON TASK STEP AND RESPONSE LEVEL FOR EACH SUBJECT FROM FIRST TO FINAL DAY OF INSTRUCTION

SUBJECT	TASK	TASK STEP-RESPONSE LEVEL First Day of Instruction		TASK STEP-RESPONSE LEVEL Final Day of Instruction	
1	To Swing on a Rope	2	Complete Manipulation	2	Complete Manipulation
2	To Jump Down From a Box	3	Complete Manipulation	3	Complete Manipulation
3	To Pedal A Tricycle	3	Manipulative Prompt	3	Manipulative Prompt
4	To Hang From Knees On A Horizontal Bar	2	Complete Manipulation	2	Complete Manipulation
5	A Forward Roll	2	Manipulative Prompt	2	Demonstration
6	To Pedal A Tricycle	1	Manipulative Prompt	3	Manipulative Prompt
7	To Swing A Plastic Baseball Bat and Strike A Large Light Ball	2	Complete Manipulation	2	Complete Manipulation
8	To Seat Drop on the Trampoline	2	Complete Manipulation	2	Complete Manipulation

APPENDIX E

Breakdown of Categories of Interobserver Agreement

TABLE 1XX

PERCENT INTEROBSERVER AGREEMENT FOR EACH BEHAVIORAL CATEGORY ACROSS INSTRUCTIONAL EPISODES

		Agreements	Disagreements	Percent Inter-Observer Agreement
Desired Response	Attention	27	1	96.4
	Position	16	2	88.8
	Execution	43	1	97.7
Pre-response Physical	Complete Manipulation	17	10	62.9
	Manipulative Prompt	11	15	42.3
	Minimal Guidance	5	2	71.4
Pre-response Visual	Demonstration-Teacher	12	2	85.7
	Demonstration Student	9	1	90.0
	Partial Skill Demonstration	3	3	50.0
	Gesture	22	5	81.4
Pre-response Verbal	Skill Cue	31	1	96.8
	Skill Mand	19	1	95.0
	Action Cue	39	1	97.5
	Pause	3	0	100.0
Response	Correct Response	44	4	91.6
	Incomplete Response	11	4	73.3
	Incorrect Response	2	6	25.0
	Negativism	17	1	94.4
Post-response Physical	Complete Manipulation	8	0	100.0
	Manipulative Prompt	4	3	57.1
	Minimal Guidance	0	2	0
	General Feedback	7	1	87.5
Post-response Visual	Demonstration	0	0	0
	Partial Skill Demonstration	1	0	100.0
	Gesture	0	0	0
Post-response Verbal	Skill Cue	25	1	96.1
	Skill Mand	0	0	0
	Action Cue	0	0	0
	General Feedback	61	1	98.3